SITE IMPROVEMENT PLANS

FOR A PROPOSED MULTI-FAMILY DEVELOPMENT CONSISTING OF 4 DWELLING UNITS

GREENWICH BAY TOWNHOUSES

5 WILLIAMS STREET WARWICK, RHODE ISLAND AP 220, LOT 95

ZONING DISTRICT: RESIDENCE A-10 DISTRICT (A-10) with (PDR-L) PLANNED RESIDENTIAL-LIMITED OVERLAY



IMAGE COURTESY OF STUDIO 401ARCHITECTURE, LLC

JOSEPH A. CASALI 7250 REGISTERED PROFESSIONAL PIGINEER 1 2 / 5 / 2023

STIPULATIONS PER THE FEBRUARY 8, 2023 MASTER PLAN APPROVAL

- THAT WORK IMMEDIATELY ADJACENT TO THE TRAIN TRACK MAY REQUIRE REVIEW AND AUTHORIZATION FROM THE CONSOLIDATED RAIL CORPORATION.
- THAT, SANITATION SERVICES SHALL BE PRIVATE AND ALL COST(S) SHALL BE BORNE BY THE PROPERTY OWNERS. THE CITY OF WARWICK WILL NOT PROVIDE TRASH AND RECYCLING SERVICES.

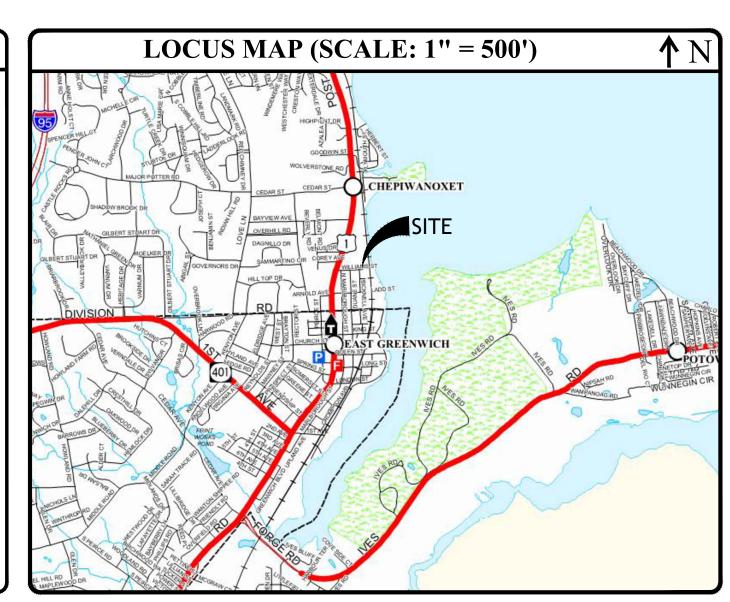
APPROVALS:

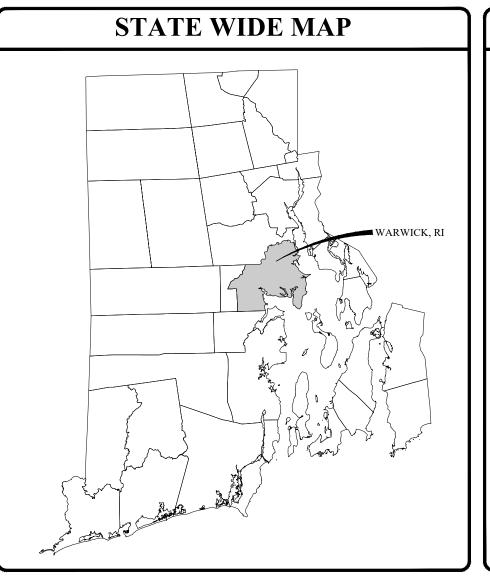
WARWICK PLANNING BOARD OF REVIEW - MASTER PLAN APPROVAL WITH A CITY COUNCIL ZONE CHANGE RECOMMENDATION (FEBRUARY 8, 2023)
WARWICK CITY COUNCIL - PETITION GRANTED FOR A ZONE CHANGE OF THE SUBJECT PARCEL TO RESIDENCE A-10 DISTRICT (A-10) WITH THE PLANNED DISTRICT RESIDENTIAL-LIMITED (PDR-L) OVERLAY (APRIL 17, 2023)
RHODE ISLAND COASTAL RESOURCE MANAGEMENT COUNCIL (CRMC) - CATEGORY 'A' COUNCIL ASSENT NO. A2023-07-069 (OCTOBER 12, 2023)

FILINGS:

- WARWICK PLANNING BOARD OF REVIEW PRELIMINARY PLAN
- KENT COUNTY WATER AUTHORITY
- WARWICK SEWER AUTHORITY
- WARWICK DEPARTMENT OF PUBLIC WORKS, ENGINEERING DIVISION

PROJECT TEAM						
OWNER/ APPLICANT:	JMR PROPERTIES, INC. C/O MR. STEPHEN MILLER 40 MALBONE STREET WARWICK, RI 02888 PHONE: 401-641-4455	CIVIL ENGINEER:	JOE CASALI ENGINEERING, INC. 300 POST ROAD WARWICK, RI 02888 PHONE: 401-944-1300 FAX: 401-944-1313			
ARCHITECT:	STUDIO 401ARCHITECTURE, LLC 5 DIVISION STREET, UNIT 39 WARWICK, RI 02818 PHONE: 401-884-1546	SURVEYOR:	OCEAN STATE PLANNERS, INC. 1225 OAKLAWN AVENUE CRANSTON, RI 02920 PHONE: 401-463-9696			
		LANDSCAPE ARCHITECT:	DIANE C. SOULE & ASSOCIATES, ASLA 422 FARNUM PIKE SMITHFIELD, RI 02917 PHONE: 401-231-0736			





SHEET NO. PLAN 1 COVER SHEET 2 GENERAL NOTES AND LEGEND 3 EXISTING CONDITIONS & SITE PREPARATION PLAN 4 SITE PLAN 5 GRADING & DRAINAGE PLAN 6 UTILITY PLAN 7 DETAILS I 8 DETAILS II 9 KCWA NOTES R1 BOUNDARY STAKE-OUT SURVEY, PREPARED BY OCEAN STATE PLANNERS, DATED NOVEMBER 2023 R2 LANDSCAPE PLAN, PREPARED BY DIANE C. SOULE AND ASSOCIATES, DATED JULY 2023

INDEX OF DRAWINGS

EENWICH BAY TOWNHOUSES

5 WILLIAMS STREET

WARWICK, RHODE ISLAND

NO. DATE. DESCRIPTION
R1 1/9/22 REV. SETBACKS
R2 7/2023 PERMIT SET
R3 12/2023 CITY COMMENTS

DESIGNED BY: WMLJR
DRAWN BY: SEP
CHECKED BY: JAC
DATE: 20-10b
PROJECT NO: NOV. 2022

PRELIMINARY, NOT FOR CONSTRUCTION

> COVER SHEET

SHEET 1 OF 9

- CLASS I PROPERTY LINE & CLASS III TOPOGRAPHIC SURVEY COMPLETED BY OCEAN STATE PLANNERS, INC. OF 1255 OAKLAWN AVENUE, CRANSTON, RI 02920 IN FEBRUARY 2022.
- 2. THE SITE LIES WITHIN FLOOD ZONE X (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN) AS SHOWN ON THE FIRM MAP FOR THE CITY OF WARWICK, MAP NUMBER 44003C0137H, EFFECTIVE DATE SEPTEMBER 18, 2013.
- 3. THE SUBJECT PARCEL IS NOT LOCATED WITHIN A HISTORIC DISTRICT. THERE ARE NO EXISTING STRUCTURES LOCATED ON THE SUBJECT PARCELS LISTED ON THE NATIONAL HISTORIC REGISTER. THERE ARE NO HISTORIC CEMETERIES OR STONE WALLS ON OR IMMEDIATELY ADJACENT TO THE PROPOSED DEVELOPMENT.
- 4. THERE ARE NO EASEMENTS WITHIN THE SUBJECT PARCEL
- 5. A PORTION OF THE SITE LIES WITHIN THE 200-FOOT CRMC JURISDICTIONAL BUFFER ASSOCIATED WITH GREENWICH COVE.
- 6. EXISTING SOILS ON THE SITE HAVE BEEN CLASSIFIED AS HINCKLEY LOAMY SAND, 8-15 SLOPES (HKC). HKC SOILS ARE CLASSIFIED AS HYDROLOGIC GROUP A AND ARE CONSIDERED FARMLAND OF STATEWIDE IMPORTANCE.
- 7. THE SUBJECT PARCEL IS NOT LOCATED WITHIN A NATURAL HERITAGE AREA OR A GROUNDWATER PROTECTION AREA.
- 8. PUBLIC WATER, SEWER AND GAS ARE AVAILABLE TO THE PROJECT SITE.

- 1. CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING AND LEGALLY DISPOSING (R&D) OF ALL MATERIALS INDICATED ON THE
- ACCESSIBLE ROUTES, PARKING SPACES, RAMPS, SIDEWALKS, AND WALKWAYS SHALL BE CONSTRUCTED IN CONFORMANCE WITH THE FEDERAL AMERICAN WITH DISABILITIES ACT AND WITH ALL APPLICABLE STATE AND LOCAL LAWS AND REGULATIONS, WHICHEVER IS MORE STRINGENT.
- 3. STOCKPILES OF EARTH MATERIALS SHALL NOT BE LOCATED ADJACENT TO DRAINAGE STRUCTURES.
- 4. ALL DISTURBED AREAS OUTSIDE OF THE PAVED AREAS WILL RECEIVE A MINIMUM OF 6" OF LOAM AND SEED.
- 5. THE LAYOUT SHOWN REPRESENTS A GRAPHICAL DESIGN, AND PRIOR TO THE CONSTRUCTION, THE CONTRACTOR SHALL ENGAGE A PROFESSIONAL LAND SURVEYOR (PLS) REGISTERED IN THE STATE OF RHODE ISLAND TO SET AND VERIFY ALL LINES AND GRADES. ALL EXISTING UTILITY LOCATIONS AND ELEVATIONS ARE TO BE CONFIRMED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. ANY ITEMS FOUND WHICH DO NOT MATCH THE PLANS MUST BE BROUGHT TO THE ENGINEERS ATTENTION PRIOR TO CONSTRUCTION FOR REVIEW. NO WORK SHALL PROCEED UNTIL AUTHORIZED BY THE ENGINEER.
- 6. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN SURVEY LAYOUT SERVICES FOR THE WORK AND SHALL SUBMIT "AS-BUILT" DRAWINGS OF ALL WORK, WHICH SHALL BE STAMPED AND CERTIFIED BY A RHODE ISLAND REGISTERED PROFESSIONAL LAND
- 7. ANY ITEM OF WORK NOT SPECIFICALLY INDICATED ON THE PLANS BUT IS REQUIRED FOR THE COMPLETE CONSTRUCTION OF THE PROJECT WILL BE CONSIDERED INCIDENTAL TO THE CONTRACT AND INCLUDED IN THE CONTRACT BID PRICE. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL EXISTING SITE CONDITIONS.
- REFER TO ARCHITECTURAL PLANS, STRUCTURAL PLANS, PLUMBING PLANS AND ELECTRICAL PLANS FOR ACTUAL SIZE OF THE PROPOSED BUILDINGS AND WORK WITHIN 5 FEET OF THE PROPOSED BUILDINGS.
- WHERE NECESSARY TO REMOVE CURBS, CATCH BASINS OR DRAINS TO COMPLETE WORK, THE CONTRACTOR SHALL REPLACE
- 10. ANY EXISTING PIPE OR UTILITY DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED IMMEDIATELY BY THE CONTRACTOR AT NO COST TO THE OWNER.
- 11. THE CONTRACTOR SHALL RESTORE TO ITS ORIGINAL CONDITION OR REPLACE TREES, SHRUBS, FENCES, SIGNS, GUARDRAILS, DRIVEWAYS, SIDEWALKS AND ANY OTHER OBJECT AFFECTED BY THIS OPERATION, UNLESS OTHERWISE NOTED ON THE SITE
- 12. THE TOPS OF ALL VALVE BOXES AND CURB BOXES SHALL BE FLUSH WITH GROUND OR PAVEMENT SURFACE LEVEL AND PLUMB, UNLESS OTHERWISE DIRECTED.
- 13. ROADWAYS SHALL BE LEFT PASSABLE AT ALL TIMES. CLOSURE OF ROADWAY IS NOT PERMITTED.

SUCH ITEMS TO THE SATISFACTION OF THE OWNER AT NO ADDITIONAL COST TO THE OWNER.

- 14. WATER SERVICE SHALL BE MAINTAINED AT ALL TIMES.
- 15. IF ENCOUNTERED, ALL LEDGE TO BE REMOVED BY MECHANICAL MEANS.
- 16. ALL CONSTRUCTION WORK SHALL BE PERFORMED IN THE DRY. THE CONTRACTOR SHALL PROVIDE, OPERATE AND MAINTAIN ALL PUMPS, DRAINS, WET POINTS, SCREENS, OR OTHER FACILITIES NECESSARY TO CONTROL, COLLECT AND DISPOSE OF ALL SURFACE AND SUBSURFACE WATER ENCOUNTERED IN THE PERFORMANCE OF THE WORK.
- 17. ALL SITE WORK, INCLUDING BUT NOT LIMITED TO, BITUMINOUS PAVEMENT, ROADWAY CONSTRUCTION, AGGREGATE MATERIALS, DRAINAGE STRUCTURES, CURBING, SIDEWALK, LANDSCAPING, SAW CUTTING, ETC. SHALL CONFORM TO THE RHODE ISLAND DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADWAY AND BRIDGE CONSTRUCTION, AMENDED DECEMBER 2010 (WITH LATEST ADDENDA) AND THE RIDOT STANDARD DETAILS, 1998 EDITION (WITH LATEST ADDENDA).

MAINTENANCE AND PROTECTION OF TRAFFIC NOTES:

- 1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL MAINTENANCE AND PROTECTION OF PEDESTRIAN AND VEHICULAR TRAFFIC INCLUDING POLICE PROTECTION. ALL TEMPORARY AND VEHICULAR SIGNS, BARRICADES AND LANE CLOSURES SHALL BE IN CONFORMANCE WITH THE LATEST REVISIONS OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), 2009 FDITION.
- 2. TEMPORARY CONSTRUCTION SIGNS AND ALL APPLICABLE TRAFFIC CONTROL DEVICES SHALL BE IN PLACE PRIOR TO THE START OF WORK IN ANY AREA OPEN TO TRAFFIC.
- 3. THE PRIVATE VEHICLES OF CONSTRUCTION WORKERS SHALL NOT BE PARKED IN THE CITY RIGHT-OF-WAY.
- 4. ALL MAINTENANCE AND PROTECTION OF TRAFFIC CONTROL SETUPS, SIGNS CHANNELING DEVICES, ETC, SHALL BE IN ACCORDANCE WITH THE LATEST REVISIONS OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, 2009 EDITION.
- 5. SIGN MOUNTINGS SHALL BE IN ACCORDANCE WITH THE RIDOT SPECIFICATIONS FOR TEMPORARY CONSTRUCTION SIGNS.

DRAINAGE SYSTEM NOTES:

- 1. THE PROPOSED DRAINAGE LINES SHALL BE ADS N-12 HDPE PIPE OR AN APPROVED EQUAL UNLESS OTHERWISE NOTED ON THE SITE PLANS.
- 2. ALL RIM ELEVATIONS SHOWN ARE APPROXIMATE AND ARE TO BE SET FLUSH WITH FINAL GRADES.

SOIL EROSION AND SEDIMENTATION CONTROL NOTES

- THE LIMITS OF CLEARING, GRADING, AND DISTURBANCE SHALL BE KEPT TO A MINIMUM WITHIN THE PROPOSED AREA OF CONSTRUCTION. ALL AREAS OUTSIDE OF THESE LIMITS, AS DEPICTED ON THE PLAN SHALL BE TOTALLY UNDISTURBED, TO REMAIN IN
- ALL CATCH BASINS SHALL BE PROTECTED WITH SILTSACK SEDIMENT TRAPS DURING CONSTRUCTION ACTIVITIES. ALL PROPOSED STORM WATER DISCHARGE AREAS SHALL BE LINED WITH A RIPRAP SPLASH PAD AND PROTECTED WITH STAKED HAYBALE OUTLET PROTECTION (R.I. STD. 9.1.0), OR STAKED HAYBALE WITH SILT FENCE (R.I. STD. 9.3.0) OUTLET PROTECTION (STAKED HAYBALE OR STAKED HAYBALE WITH SILT FENCE) SHALL ALSO BE INSTALLED AT ALL EXISTING STORMWATER DISCHARGE LOCATIONS WHERE DISTRIBUTING PIPES, CATCH BASINS, AND MANHOLES ARE TO BE CLEANED AND FLUSHED.
- 3. ALL DISTURBED SLOPES EITHER NEWLY CREATED OR CURRENTLY EXPOSED SHALL BE SEEDED, PROTECTED AND MAINTAINED BY THE CONTRACTOR. THE CONTRACTOR SHALL REGULARLY CHECK ALL SEEDED AREAS TO ENSURE THAT A GOOD STANDING OF VEGETATION
- ALL SILT FENCE, TEMPORARY TREATMENT (HAY, STRAW, ETC.) AND TEMPORARY EROSION PROTECTION SHALL BE MAINTAINED BY THE CONTRACTOR THROUGHOUT CONSTRUCTION AND SHALL REMAIN IN PLACE UNTIL AN ACCEPTABLE STAND OF GRASS OR APPROVED
- 5. STOCKPILES OF TOPSOIL SHALL NOT BE LOCATED NEAR WATERWAYS. THEY SHALL HAVE SIDE SLOPES OF NO GREATER THAN 2:1 AND

SHALL BE TEMPORARILY SEEDED AND/OR STABILIZED PER CONTRACT SPECIFICATIONS.

- 6. THE SILT FENCE/HAYBALES SHALL BE CHECKED BY THE CONTRACTOR ON A WEEKLY BASIS AND AFTER EACH STORM FOR UNDERMINING OR DETERIORATION. THE CONTRACTOR SHALL REPAIR OR REPLACE ANY SILT FENCE/HAYBALES AS NEEDED. THE CONTRACTOR SHALL CLEAN THE ACCUMULATED SEDIMENT IF HALF OF THE ORIGINAL HEIGHT OF THE HAY-BALES BECOMES FILLED WITH SEDIMENTS.
- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN ALL SOIL EROSION AND SEDIMENT CONTROLS ON THE PROJECT SITE FOR THE ENTIRE DURATION OF THE CONSTRUCTION PERIOD. THE CONTRACTOR SHALL FOLLOW THE DIRECTION OF THE RESIDENT ENGINEER, TOWN ENGINEER, OR OWNER WITH REGARD TO INSTALLATION, MAINTENANCE, AND REPAIR OF ALL SOIL EROSION AND SEDIMENTATION CONTROLS ON THE PROJECT SITE. TEMPORARY SOIL EROSION AND SEDIMENTATION CONTROLS (HAYBALES, SILT FENCE, ETC.) SHALL BE MAINTAINED UNTIL ALL EXPOSED SOILS ARE SATISFACTORILY STABILIZED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING AND/OR RESEEDING ALL AREAS THAT DO NOT DEVELOP WITHIN ONE YEAR FROM THE COMPLETION OF CONSTRUCTION.
- ALL REFERENCED SOIL EROSION AND SEDIMENTATION CONTROLS INCLUDING MATERIALS USED, APPLICATION RATES AND THE INSTALLATION PROCEDURES SHALL BE PERFORMED PER THE "RHODE ISLAND EROSION AND SEDIMENTATION HANDBOOK", DATED 1993 AMENDED 2014.

MISCELLANEOUS UTILITY NOTES:

- 1. PRIOR TO CONSTRUCTION ALL POTENTIAL UTILITY/DRAINAGE CONFLICTS MUST BE IDENTIFIED BY THE CONTRACTOR. ANY MODIFICATIONS TO THE PROPOSED UTILITIES TO AVOID CONFLICTS MUST BE APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION.
- 2. OVERHEAD ELECTRIC AND TELEPHONE SERVICES ARE TO BE REMOVED BY THE APPROPRIATE UTILITY COMPANY AND COORDINATED BY
- THE CONTRACTOR SHALL AT ALL TIMES PROVIDE A SUFFICIENT NUMBER OF WORKMEN AND GUARDS AS MAY BE NECESSARY TO PROPERLY SAFEGUARD THE PUBLIC FROM THEIR OPERATIONS.
- THE CONTRACTOR SHALL TAKE PRECAUTIONS AGAINST DAMAGING OF PAVING, SIDEWALKS, UTILITIES, OR PRIVATE PROPERTIES AND SHALL PROMPTLY REPAIR AT THEIR OWN EXPENSE ANY DAMAGE TO SUCH PAVING, SIDEWALKS, UTILITIES, OR PRIVATE PROPERTIES TO THE SATISFACTION OF THE OWNER OR CITY.
- 5. EXISTING UTILITY FRAMES AND COVERS FOR SANITARY SEWER, WATER, GAS, STORM DRAINAGE AND OTHER UTILITIES SHALL BE ADJUSTED TO GRADE AS REQUIRED IN NEW PAVING AND PAVEMENT OVERLAY AREAS.
- 6. ALL SEWER CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH THE WARWICK SEWER AUTHORITY REQUIREMENTS.
- ALL NEW SEWER PIPES AND MANHOLES SHALL BE CLEANED AND TESTED PRIOR TO ACCEPTANCE. GRAVITY SEWER PIPES SHALL BE REQUIRED TO PASS BOTH LOW PRESSURE AIR AND DEFLECTION (IE., MANDREL) TESTING. LOW PRESSURE SEWER PIPING SHALL BE REQUIRED TO PASS A LOW PRESSURE (IE., HYDROSTATIC) TEST.
- A BACKFLOW PREVENTION DEVICE MUST BE INSTALLED AT EACH SEWER SERVICE BUILDING CONNECTION THAT IS BELOW THE RIM ELEVATION OF THE NEAREST SEWER MANHOLE, AS REQUIRED BY THE INTERNATIONAL PLUMBING CODE AND THE WARWICK SEWER
- 9. APPLICANT IS REQUIRED TO PROVIDE TWO SETS OF FINAL AS-BUILT PLANS TO WARWICK SEWER AUTHORITY AND ENGINEERING DEPARTMENT UPON COMPLETION OF CONSTRUCTION, PRIOR TO FINAL ACCEPTANCE. AS-BUILT PLANS SHALL INCLUDE FIELD MEASUREMENTS OF ALL INSTALLED PIPE AND APPURTENANCES, INCLUDING LENGTH, SLOPE, MANHOLE RIMS AND INVERTS, AS WELL AS SWING TIES/MEASUREMENTS TO ALL MANHOLES, SEWER STUBS, AND/OR LATERAL SERVICE CONNECTIONS.
- 10. INSPECTION OF ALL SEWER CONSTRUCTION SHALL BE PERFORMED BY WARWICK SEWER AUTHORITY. APPLICANT SHALL PROVIDE SCHEDULE FOR CONSTRUCTION AS SOON AS POSSIBLE TO ALLOW FOR DEVELOPMENT OF INSPECTION FEE. TO BE PAID BY APPLICANT DIRECTLY TO THE WARWICK SEWER AUTHORITY. UPON PAYMENT OF FEE, COMMENCEMENT OF CONSTRUCTION INSPECTION REQUIRES MINIMUM NOTIFICATION OF 48-HOURS.
- 11. APPLICANT IS RESPONSIBLE FOR SECURING ALL REQUIRED PERMITS FROM LOCAL, STATE, AND/OR FEDERAL AGENCIES WITH REGULATORY JURISDICTION OVER THE PROPOSED WORK. COPIES OF ALL PERMITS SHALL BE PROVIDED TO THE CITY ENGINEER PRIOR TO CONSTRUCTION. ALL SEWER CONSTRUCTION SHALL BE PERFORMED BY A DRAIN LAYER LICENSED IN THE STATE OF RHODE ISLAND AND THE CITY OF WARWICK.
- 12. NO FLOW WILL BE ACCEPTED UNTIL A COMPLETION CERTIFICATE IS ISSUED.
- 13. THE CONTRACTOR SHALL CONFINE HIS CONSTRUCTION OPERATIONS AND ACTIVITIES TO WITHIN THE STREET LINES, EASEMENT AND/OR RIGHT-OF-WAY, AS SHOWN ON THE DRAWINGS.
- 15. PRIOR TO CONSTRUCTION OF THE RELOCATION OF ALL WATER MAINS, THE CONTRACTOR SHALL COORDINATE WITH PROVIDENCE WATER SUPPLY BOARD FOR INSPECTION AND CHLORINATION OF NEW PIPING, FITTINGS AND VALVES.

BMP MAINTENANCE SCHEDULE:

- 1. ALL MAINTENANCE (INCLUDING CLEANING) REQUIRED DURING THE CONSTRUCTION PHASE OF THE PROJECT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL INCLUDE:
- A. MEASURES NEEDED TO ENSURE THE PROPER OPERATION OF THE STORMWATER RUNOFF (DRAINAGE) AND WATER QUALITY CONTROL SYSTEMS TO INCLUDE INSPECTION, CLEANING AND REPAIRS ALL PIPES, INTAKE AND DISCHARGE STRUCTURES, CATCH BASIN SUMPS, AND MANHOLES.
- B. INSPECTION OF ALL SLOPES, BERMS, AND OTHER CONTROL STRUCTURES FOR STRUCTURAL INTEGRITY/STABILITY AND EVIDENCE OF SOIL EROSION PROCESSES, AND MAINTENANCE OF THESE STRUCTURES IF NECESSARY. INSPECTIONS SHALL BE PERFORMED FOLLOWING ALL RAIN EVENTS OF 1/2 INCH
- UPON COMPLETION OF THE PROJECT CONSTRUCTION, AND PRIOR TO VACATING THE SITE, THE CONTRACTOR SHALL CONDUCT A FINAL INSPECTION AND CLEANING OF THE DRAINAGE SYSTEM AND ALL ASSOCIATED STRUCTURES.
- ALL INSTALLATION, CLEANING, AND MAINTENANCE OF THE STORMWATER DRAINAGE SYSTEM SHALL FOLLOW AT LEAST THE RHODE ISLAND DEPARTMENT OF TRANSPORTATION MINIMUM STANDARDS, SECTION 212 AND SECTION 708. WHERE APPROPRIATE, PROCEDURES REGARDING THE DRAINAGE INSTALLATION, CLEANING, INSPECTION, AND MAINTENANCE OF THE STORMWATER DRAINAGE SYSTEM SHALL BE FOLLOWED AS OUTLINED IN THE "RHODE ISLAND STORMWATER DESIGN AND INSTALLATION STANDARDS MANUAL" (RIDEM/RICRMC, 2010).
- AFTER CONSTRUCTION, STORMWATER BMPS SHALL BE INSPECTED AND MAINTAINED BY THE CONDOMINIUM ASSOCIATION AS FOLLOWS:

ROOF DRAIN LEADERS

PERFORM ROUTINE ROOF INSPECTIONS QUARTERLY.

RAINFALL OR MORE IN A 24-HOUR PERIOD, OR BI-MONTHLY IF NO RAINFALL EVENT OCCURS.

- KEEP ROOFS CLEAN AND FREE OF DEBRIS.
- KEEP ROOF DRAINAGE SYSTEMS CLEAR.

UNDERGROUND INFILTRATION SYSTEM

- INFILTRATION SYSTEMS SHALL BE INSPECTED ON A BI-ANNUAL BASIS TO ENSURE PROPER FUNCTIONS. INSPECTION PORTS SHALL BE USED TO VERIFY THAT THE SYSTEMS ARE DRAINING WITHIN 72 HOURS. IF THE SYSTEM FAILS TO DRAIN WITHIN 72-HOURS, THE SYSTEM SHALL BE CLEANED OR REPLACED AS NECESSARY.
- THE INFILTRATION SYSTEM SHALL BE INSPECTED BI-ANNUALLY FOR SEDIMENT ACCUMULATIONS.. IF THE SYSTEM HAS ACCUMULATED 3 INCHES OF SEDIMENT, THE SEDIMENT SHALL BE REMOVED BY FLUSHING FROM THE SYSTEM WITH HIGH PRESSURE WATER JETS AND AND VACUUMING THE SEDIMENT AND DEBRIS THROUGH THE ACCESS PORTS. ALL SEDIMENT REMOVED SHALL BE DISPOSED OF IN ACCORDANCE WITH ALL STATE AND FEDERAL REGULATIONS.

- DURING THE SIX MONTHS IMMEDIATELY AFTER CONSTRUCTION, THE INFILTRATION BASIN SHALL BE INSPECTED AFTER THE FIRST TWO RAINFALL EVENTS OF AT LEAST 1.0 INCH TO ENSURE THE SYSTEM IS FUNCTIONING PROPERLY. THEREAFTER INSPECTIONS SHALL BE CONSTRUCTED ON AN ANNUAL BASIS AND AFTER STORM EVENTS GREATER THAN OR EQUAL TO 2 INCHES.
- SILT AND SEDIMENT SHALL BE REMOVED FROM THE BASIN WHEN THE ACCUMULATION EXCEEDS SIX INCHES, OR WHEN WATER PONDS ON THE SURFACE OF THE INFILTRATION BASIN FOR MORE THAN 48 HOURS.
- SOIL ERIOSION GULLIES SHALL BE REPAIRED WHEN THEY OCCUR.
- THE OUTLET DEVICES SHALL BE CLEANED/REPAIRED WHEN NECESSARY.
- TRASH AND DEBRIS SHALL BE REMOVED WHEN NECESSARY.
- THE OUTLET CONTROL STRUCTURE SHALL BE INSPECTED ANNUALLY TO ENSURE THAT IT IS FUNCTIONING PROPERLY.

ALL REMOVED SEDIMENT IS TO BE TESTED TO DETERMINE POLLUTANT CONTENT. SEDIMENT IS TO BE PROPERLY DISPOSED OF BASED UPON THE TEST RESULTS AND LOCAL, STATE, AND FEDERAL REGULATIONS.

SEEDING ACTIVITIES SHALL BE PERFORMED IN ACCORDANCE WITH SECTION L.02 SEEDING OF THE RHODE ISLAND DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADWAY AND BRIDGE CONSTRUCTION, 2010 EDITION (WITH LATEST ADDENDA), AND SHALL ALSO CONFORM TO THE FOLLOWING:

- AFTER ROUGH GRADING IS COMPLETED, ALL DISTURBED AREAS AND AREAS LABELED AS 'LOAM AND SEED' ARE TO BE BROUGHT TO AN ELEVATION OF 6" BELOW THE PROPOSED FINISHED GRADE. SCARIFY THE SUBGRADE TO A DEPTH OF 12" WITH THE TEETH OF A BACKHOE OR A POWER RAKE TO RESULT IN AN UNCOMPACTED SUBSOIL. 6" OF GOOD QUALITY TOPSOIL IS TO BE APPLIED AND RAKED TO FINISHED GRADE.
- THE TOPSOIL IS TO BE GOOD QUALITY LOAM, FERTILE AND FREE OF WEEDS, STICKS AND STONES OVER 3/4" IN SIZE AND OTHERWISE COMPLYING WITH SECTION M.18.01 OF THE RHODE ISLAND DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADWAY AND BRIDGE CONSTRUCTION, 2010 EDITION (WITH LATEST ADDENDA),
- PRIOR TO SEEDING OR SODDING, FERTILIZE WITH 10-10-10 OR EQUIVALENT ANALYSIS. AT LEAST 40% OF THE FERTILIZER NITROGEN SHALL BE IN SLOW RELEASE FORM. INCORPORATE THE FERTILIZER INTO THE TOP 1-2" OF THE PLANTING SOIL. APPLY AT A RATE OF 8 LBS. PER 1000 SQUARE FEET.
- 4. APPLY LIME AT A RATE OF ONE TON PER ACRE AND UNIFORMLY INCORPORATE INTO THE TOP 1-2" OF TOPSOIL.

AFTER THE SEED BED IS PREPARED, SEED IS TO BE BROADCAST EVENLY OVER THE SURFACE AND WORKED INTO THE TOP 1" OF SOIL. SEED SHALL BE APPROVED URI #2 OR APPROVED EQUAL. APPLY AT A RATE OF 4-5 LBS. PER 1000 SQUARE FEET OR AS OTHERWISE DIRECTED BY THE MANUFACTURER.

URI #2 IMPROVED SEED MIX, % BY WEIGHT:

40% CREEPING RED FESCUE

- 20% IMPROVED PERENNIAL RYEGRASS 20% IMPROVED KENTUCKY BLUEGRASS
- 20% KENTUCKY BLUEGRASS
- RECOMMENDED SEEDING DATES ARE APRIL 1 TO JUNE 15 AND AUGUST 15 TO OCTOBER 15. AT THE CONTRACTORS DISCRETION, SEED MAY BE APPLIED BY HYDROSEEDING RATHER THAN THE METHOD DESCRIBED ABOVE.

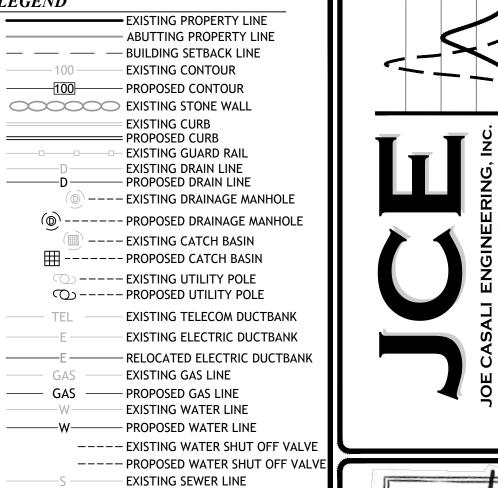
SEQUENCE & STAGING OF PROPOSED CONSTRUCTION ACTIVITIES:

THIS IS A GENERAL SEQUENCE AND STAGING OF CONSTRUCTION ACTIVITIES. A DETAILED SEQUENCE WITH TIME LINES SHALL BE ESTABLISHED BY THE CONTRACTOR IN COORDINATION WITH THE OWNER, ENGINEER AND SITE CONTRACTORS PRIOR TO THE START OF CONSTRUCTION.

- 1. SURVEY AND STAKE THE PROPOSED DRAINAGE BMP'S (UNDERGROUND INFILTRATION CHAMBER SYSTEMS), PARKING LOTS, WATER LINE, SEWER LINE AND LIMIT
- 2. PLACE SEDIMENTATION BARRIERS (SILT FENCE) AS SHOWN ON THE PLANS AND AS STAKED OUT IN THE FIELD. IN NO CASE IS THE LIMIT OF WORK TO EXTEND BEYOND THE SEDIMENTATION BARRIERS.
- THE STOCKPILES ARE TO BE PROTECTED BY A ROW OF SEDIMENTATION BARRIERS. STOCKPILES TO BE COVERED OR TEMPORARILY SEEDED.

3. BEGIN SITE WORK (CLEARING AND GRUBBING, EXCAVATING AND GRADING ETC.)TOPSOIL IS TO STRIPPED AND STOCKPILED WITHIN DISTURBANCE LIMITS.

- 4. EXCAVATE AND CONSTRUCT STORMWATER MANAGEMENT AREAS AS SHOWN ON PLAN. DIVERT ALL THE RUNOFF FROM DISTURBED AREAS TO THE PROPOSED STORMWATER STORAGE AREA.
- 5. INSTALL UTILITIES AND DRAINAGE INCLUDING DRAINAGE PIPE. SEED ALL DISTURBED AREAS.
- 6. BEGIN BUILDING CONSTRUCTION.
- 7. BEGIN PAVEMENT AND PROPOSED GRADING.
- FINISH PAVEMENT CONSTRUCTION.
- 9. MAINTAIN SEDIMENT AND EROSIONS CONTROLS WHILE BUILDING ARE CONSTRUCTED
- 10. FINISH LANDSCAPING AND PERMANENT STABILIZATION.
- 11. INSPECT AND REPAIR ALL DRAINAGE STRUCTURES INCLUDING DISCHARGE POINTS. REMOVE ANY DEBRIS (LEAVES, TREE LIMBS, BOULDERS, ETC.) FROM DRAINAGE INLETS AND OUTLETS. FLUSH ALL SEDIMENTS FROM DRAINAGE PIPES AND APPLY TOPSOIL TO PONDS.
- 12. REMOVE ALL TEMPORARY SOIL EROSION AND SEDIMENTATION CONTROL MEASURES ONCE VEGETATION HAS BEEN ESTABLISHED TO ALL DISTURBED AREAS.



LEGEND

PROPOSED SEWER LINE

TREELINE

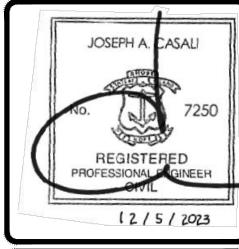
(S) ---- EXISTING SEWER MANHOLE

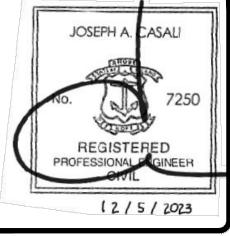
(\$) ----- PROPOSED SEWER MANHOLE

N/F ---- NOW OR FORMERLY

— LOD ——— LIMIT OF DISTURBANCE

---- TEST HOLE





REVISIONS: NO. DATE. DESCRIPTION R1 1/9/22 REV. SETBACKS R2 7/2023 PERMIT SET R3 12/2023 CITY COMMENTS

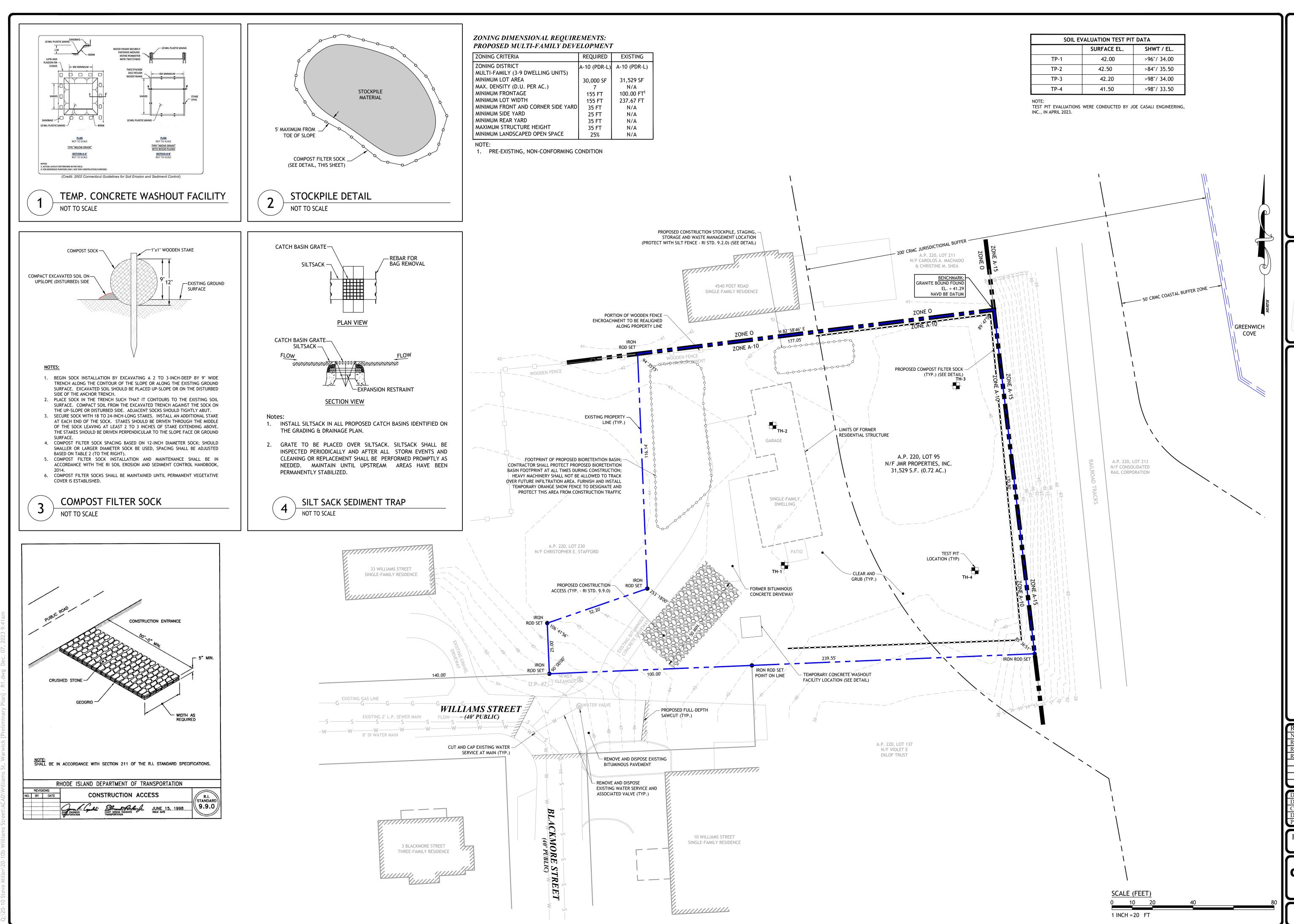
DESIGNED BY: WMLJR DRAWN BY: SEP CHECKED BY: JAC

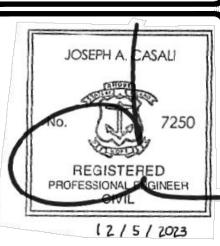
PRELIMINARY, NOT FOR CONSTRUCTION

PROJECT NO: NOV. 2022

GENERAL NOTES & **LEGEND**

SHEET 2 OF 9





NO. DATE. DESCRIPTION R1 1/9/22 REV. SETBACKS R2 7/2023 PERMIT SET R3 12/2023 CITY COMMENTS

DRAWN BY: SEP CHECKED BY: JAC PROJECT NO: NOV. 2022

PRELIMINARY, NOT FOR CONSTRUCTION

EXISTING CONDITIONS & SITE PREP. **PLAN**

> SHEET 3 OF 9

ZONING DIMENSIONAL REQUIREMENTS: PROPOSED MIJI TI-FAMII Y DEVELOPMENT

PROPOSED MULII-FAMILI DEVELOPMENI					
	ZONING CRITERIA	REQUIRED	PROPOSED		
	ZONING DISTRICT MULTI-FAMILY (3-9 DWELLING UNITS)	A-10 (PDR-L)	A-10 (PDR-L)		
	MINIMUM LOT AREA	30,000 SF	31,529 SF		
	MAX. DENSITY (D.U. PER AC.)	7	(SEE TABLE)		
	MINIMUM FRONTAGE	155 FT	100.00 FT ¹		
	MINIMUM LOT WIDTH	155 FT	237.67 FT		
	MINIMUM FRONT AND CORNER SIDE YARD	35 FT	>35 FT		
	MINIMUM SIDE YARD	25 FT	23.2 FT		
	MINIMUM REAR YARD	35 FT	23.2 FT		
	MAXIMUM STRUCTURE HEIGHT	35 FT	<35 FT		
	MINIMUM LANDSCAPED OPEN SPACE	25%	>25%		

1. PRE-EXISTING, NON-CONFORMING CONDITION

<u>DENSITY CALCULATION:</u> DENSITY OF 7 DWELLING UNITS/ACRE

TOTAL AREA: 31,529 SF

31,529 SF * (7 D.U / 43,560 SF) = 5.06 D.U.

5 DWELLING UNITS ALLOWED 4 DWELLING UNITS PROPOSED

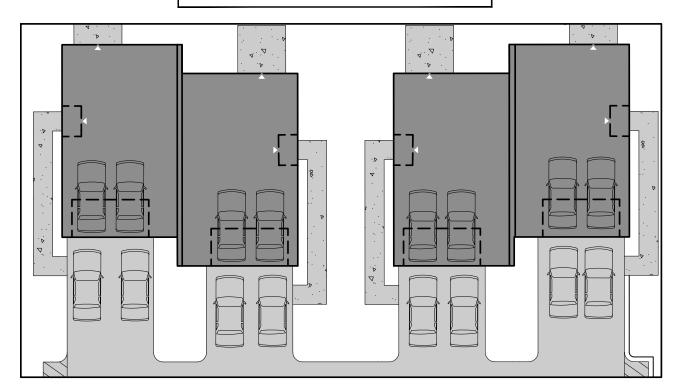
LIGHTING STATEMENT:

NO EXTERIOR LIGHTING IS PROPOSED. ONLY WALL PACKS WILL BE UTILIZED ON THE DWELLINGS AND WILL CONFORM TO CITY STANDARDS. ALL PROPOSED LIGHTING SHALL HAVE THE INTERNATIONAL DARK-SKY ASSOCIATION (IDA) FIXTURE SEAL OF APPROVAL AND WILL BE SHIELDED SO THAT THE LAMP ITSELF OR THE LAMP IMAGE IS NOT DIRECTLY VISIBLE OUTSIDE THE PROPERTY PERIMETER.

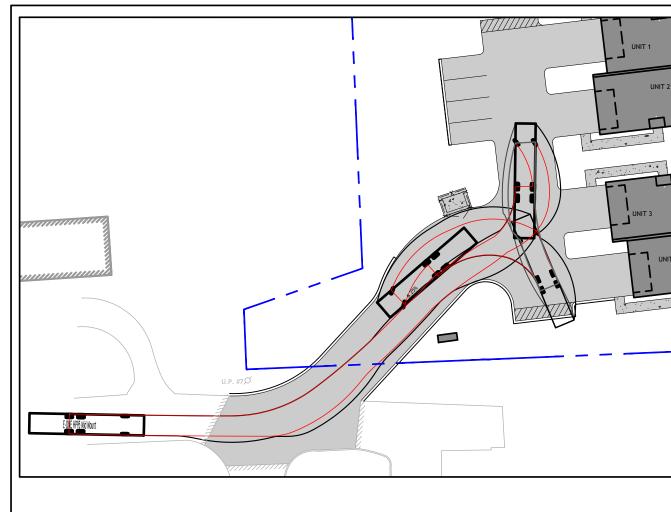
> OFF-STREET PARKING CALCULATION: PER SEC. 308.2(E) A MIN. OF 2 PARKING SPACES PER DWELLING UNIT SHALL BE REQUIRED FOR DEVELOPMENTS OF 4 UNITS OR LESS

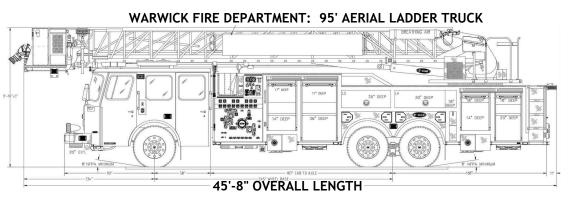
4-UNIT DEVELOPMENT: 2 SPACES * 4 D.U. = 8 SPACES

REQUIRED: 8 PARKING SPACES PROPOSED: 20 PARKING SPACES



RESIDENTIAL UNIT PARKING DETAIL SCALE 1"=20'





FIRE TRUCK TURNAROUND DETAIL SCALE 1"=40'

RELIEF RECEIVED FOR THE PROPOSED DEVELOPMENT:

PER SECTION 308.3(B) OF THE ZONING ORDINANCE: MINIMUM FRONTAGE IN THE A-10 WITH PDR-L OVERLAY IS 155 FEET **REQUIRED: 155 FEET**

PROPOSED: 100 FEET (PRE-EXISTING NON-CONFORMING CONDITION) RELIEF RECEIVED: 55 FEET

PER SECTION 308.3(B) OF THE ZONING ORDINANCE: MINIMUM SIDE YARD SETBACK

IN THE A-10 WITH PDR-L OVERLAY IS 25 FEET **REQUIRED: 25 FEET**

> PROPOSED: 23.2 FEET **RELIEF RECEIVED: 1.8 FEET**

PER SECTION 308,3(B) OF THE ZONING ORDINANCE: MINIMUM REAR YARD SETBACK

IN THE A-10 WITH PDR-L OVERLAY IS 35 FEET **REQUIRED: 35 FEET**

> PROPOSED: 23.2 FEET RELIEF RECEIVED: 11.8 FEET

PER SECTION 308.2(A) OF THE ZONING ORDINANCE: ANY SIDE WALL OF A BUILDING MAY NOT BE LESS THAN 30 FEET FROM ANY SIDE WALL OF ANOTHER BUILDING

REQUIRED: 30 FEET

PROPOSED: 20 FEET RELIEF RECEIVED: 10 FEET

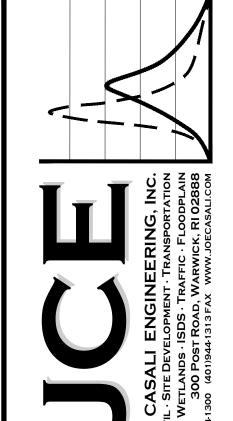
PER SECTION 308.2(E) OF THE ZONING ORDINANCE: ...NO OUTDOOR PARKING SPACE OR DRIVEWAY IS PERMITTED WITHIN 15 FEET OF ANY RESIDENTIAL BUILDING.

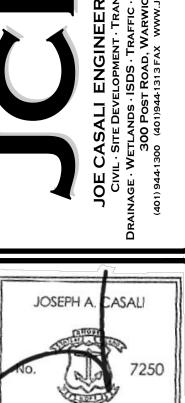
REQUIRED: 15 FEET PROPOSED: 0 FEET

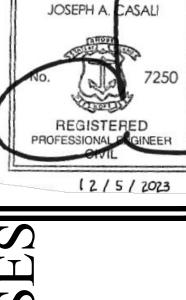
(PROPOSED INDIVIDUAL DRIVEWAYS ABUT PROPOSED RESIDENTIAL BUILDINGS)

RELIEF RECEIVED: 15 FEET









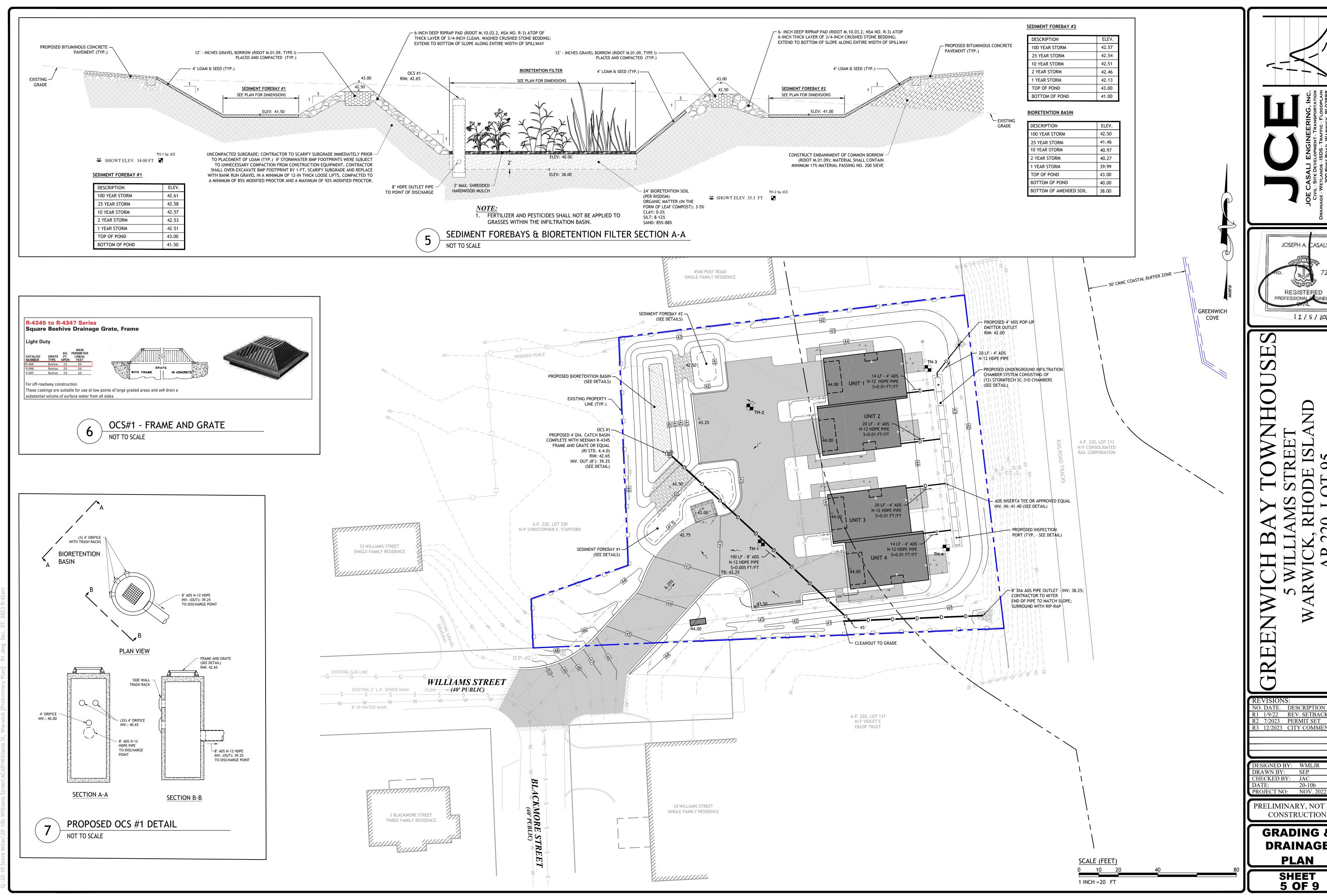
REVISIONS: NO. DATE. DESCRIPTION R1 1/9/22 REV. SETBACKS R2 7/2023 PERMIT SET R3 12/2023 CITY COMMENTS

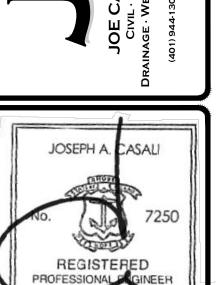
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PRELIMINARY, NOT FOR CONSTRUCTION

> SITE PLAN

SHEET 4 OF 9





12/5/2023

NO. DATE. DESCRIPTION
 R1
 1/9/22
 REV. SETBACKS

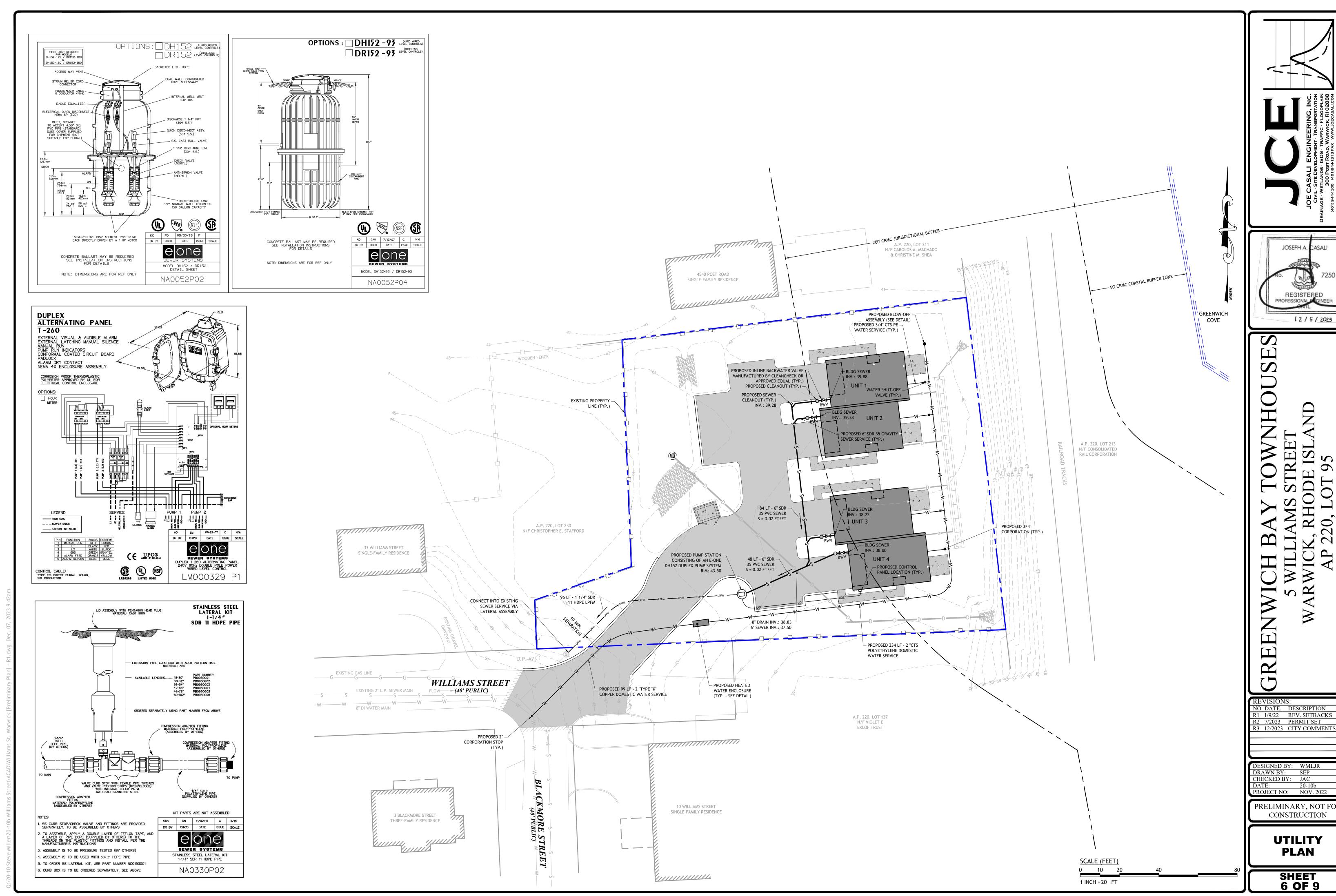
 R2
 7/2023
 PERMIT SET
 R3 12/2023 CITY COMMENTS

DESIGNED BY: WMLJR DRAWN BY: SEP CHECKED BY: JAC

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GRADING & DRAINAGE

> SHEET 5 OF 9





NO. DATE. DESCRIPTION
 R1
 1/9/22
 REV. SETBACKS

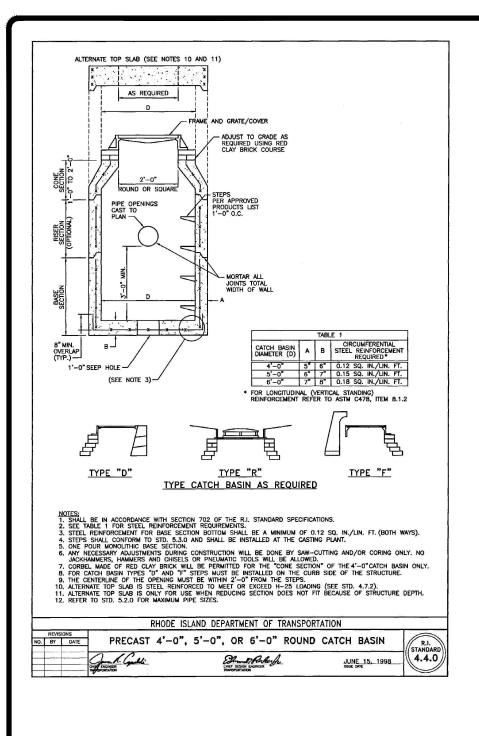
 R2
 7/2023
 PERMIT SET
 R3 12/2023 CITY COMMENTS

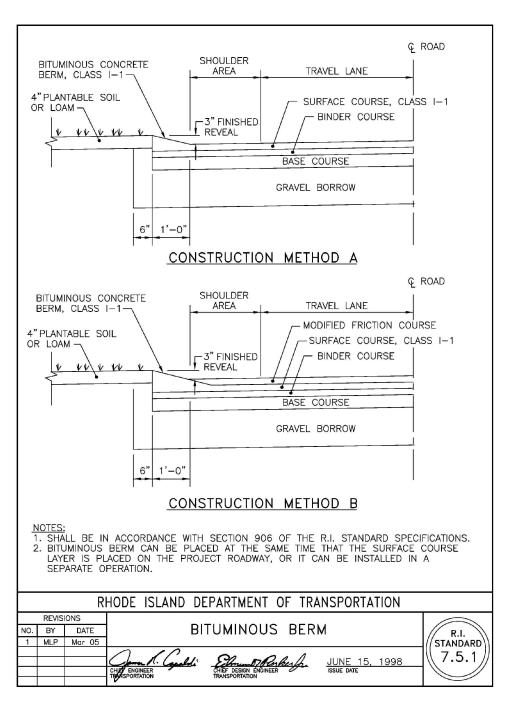
DESIGNED BY: WMLJR DRAWN BY: SEP CHECKED BY: JAC DATE: 20-10b PROJECT NO: NOV. 2022

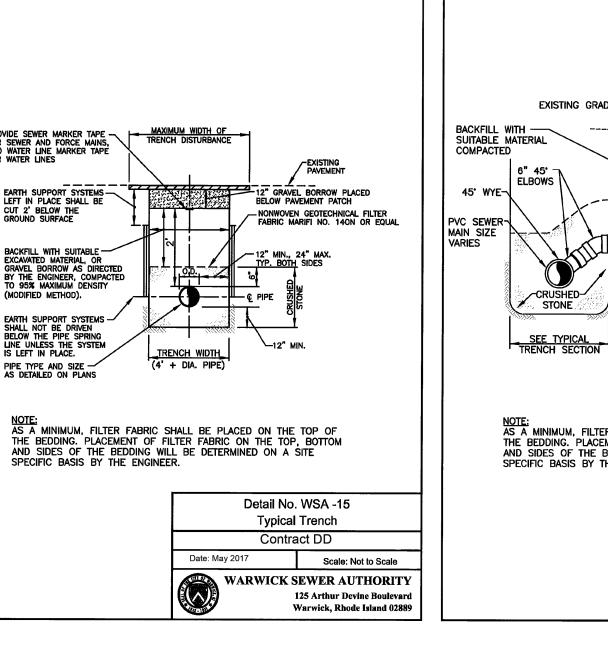
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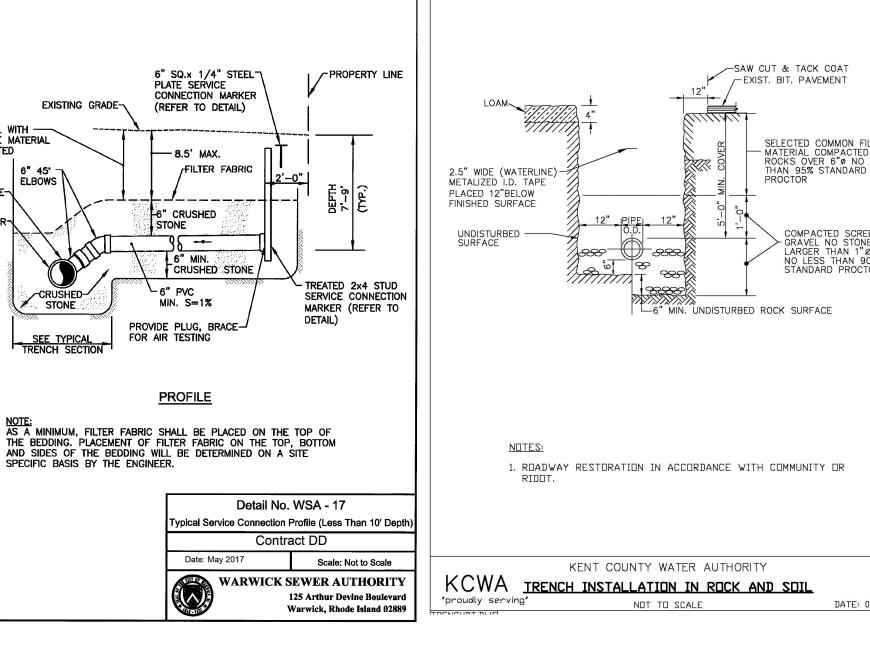
> UTILITY **PLAN**

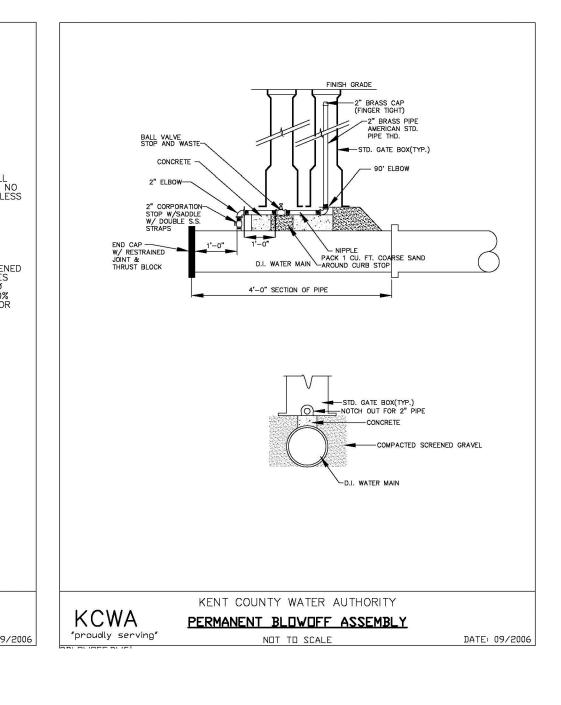
SHEET 6 OF 9

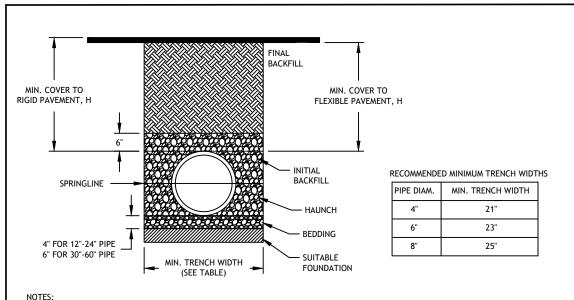












1. ALL PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321, "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST ADDITION
2. MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE FINES INTO BACKFILL MATERIAL, WHEN REQUIRED.

3. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER. AS AN ALTERNATIVE AND AT THE DISCRETION OF THE DESIGN ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL.

4. <u>BEDDING:</u> SUITABLE MATERIAL SHALL BE CLASS I, II OR III. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. UNLESS OTHERWISE NOTED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 4" (100mm) FOR 4"-24" (100mm-600mm); 6" (150mm) FOR 30"-60" (750mm-900mm).

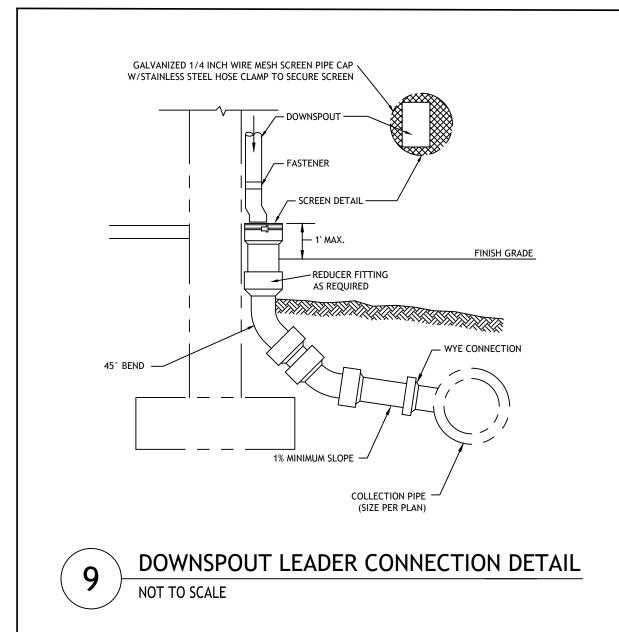
5. <u>INITIAL BACKFILL:</u> SUITABLE MATERIAL SHALL BE CLASS I, II OR III IN THE PIPE ZONE EXTENDING NOT LESS THAN 6" ABOVE CROWN OF PIPE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. MATERIAL SHALL BE INSTALLED AS

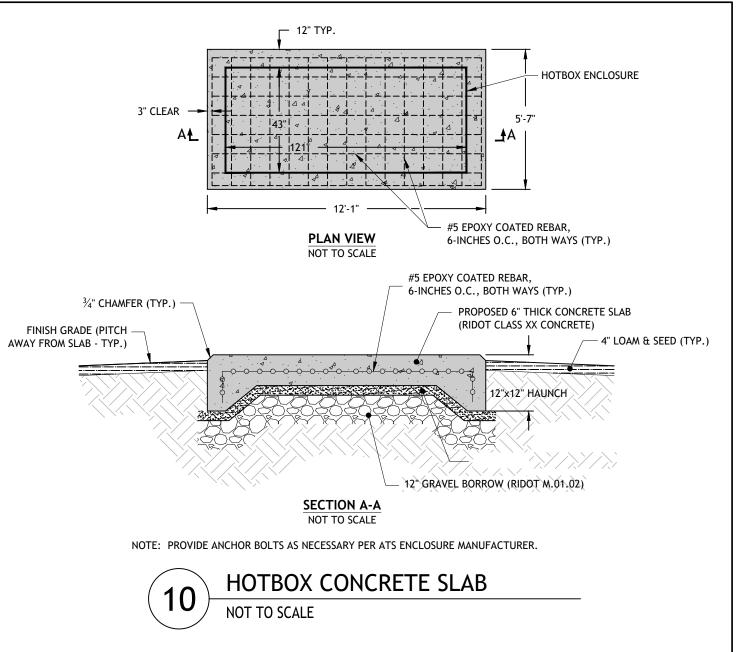
REQUIRED IN ASTM D2321, LATEST EDITION.

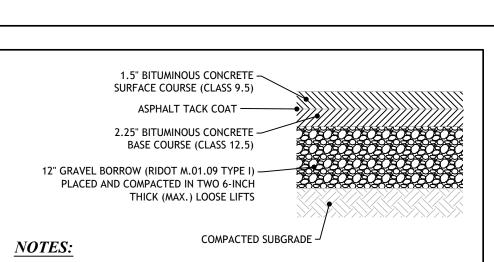
6. MINIMUM COVER: MINIMUM COVER, H, IN NON-TRAFFIC APPLICATIONS (GRASS OR LANDSCAPE AREAS) IS 12" FROM THE TOP OF PIPE TO GROUND SURFACE. ADDITIONAL COVER MAY BE REQUIRED TO PREVENT FLOTATION. FOR TRAFFIC APPLICATIONS, MINIMUM COVER, H, IS 12" UP TO 48" DIAMETER PIPE AND 24" OF COVER FOR 54"-60" DIAMETER PIPE, MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TO TOP OF RIGID PAVEMENT.

8 DRAIN PIPE TRENCH INSTALLATION DETAIL

NOT TO SCALE



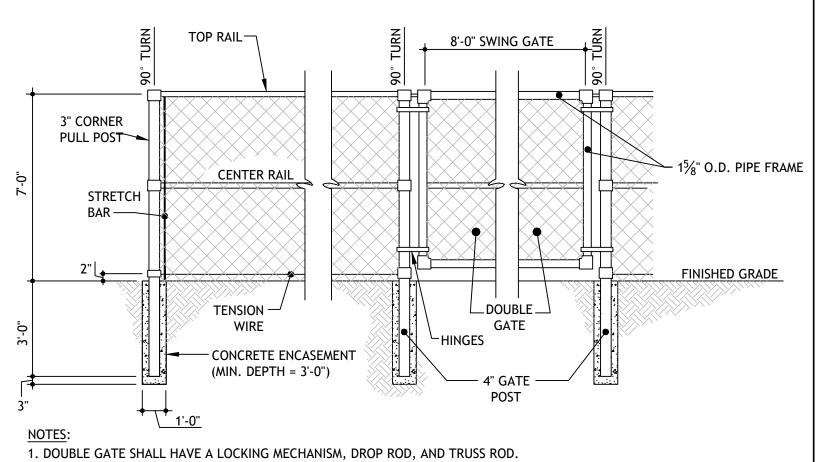




1. IF UNSUITABLE MATERIALS ARE ENCOUNTERED AT SUBGRADE ELEVATION, THE CONTRACTOR SHALL NOTIFY THE ENGINEER. THE DEPTH OF UNSUITABLE MATERIAL TO BE REMOVED WILL BE DETERMINED IN THE FIELD. THE CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE THE UNSUITABLE MATERIALS AND REPLACE WITH SUITABLE MATERIAL APPROVED BY THE ENGINEER.

2. MINIMUM COMPACTION FOR GRAVEL BORROW SUB-BASE AND SUBGRADE: 95% MODIFIED PROCTOR.

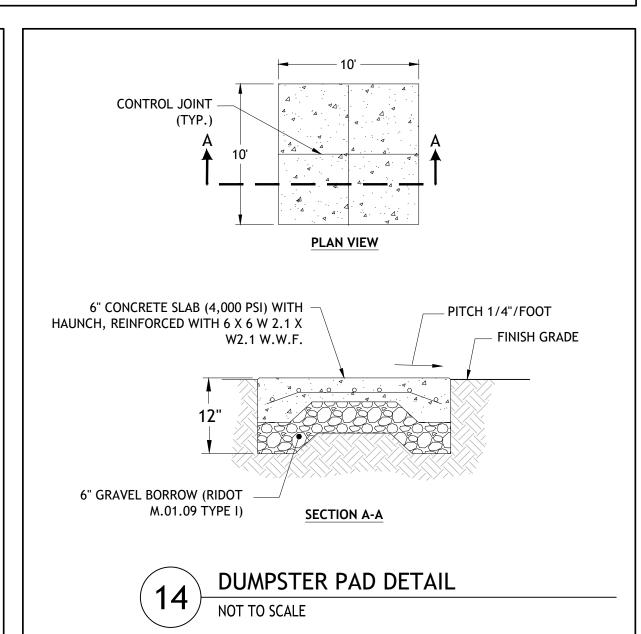
12 BITUMINOUS CONCRETE PAVEMENT
NOT TO SCALE

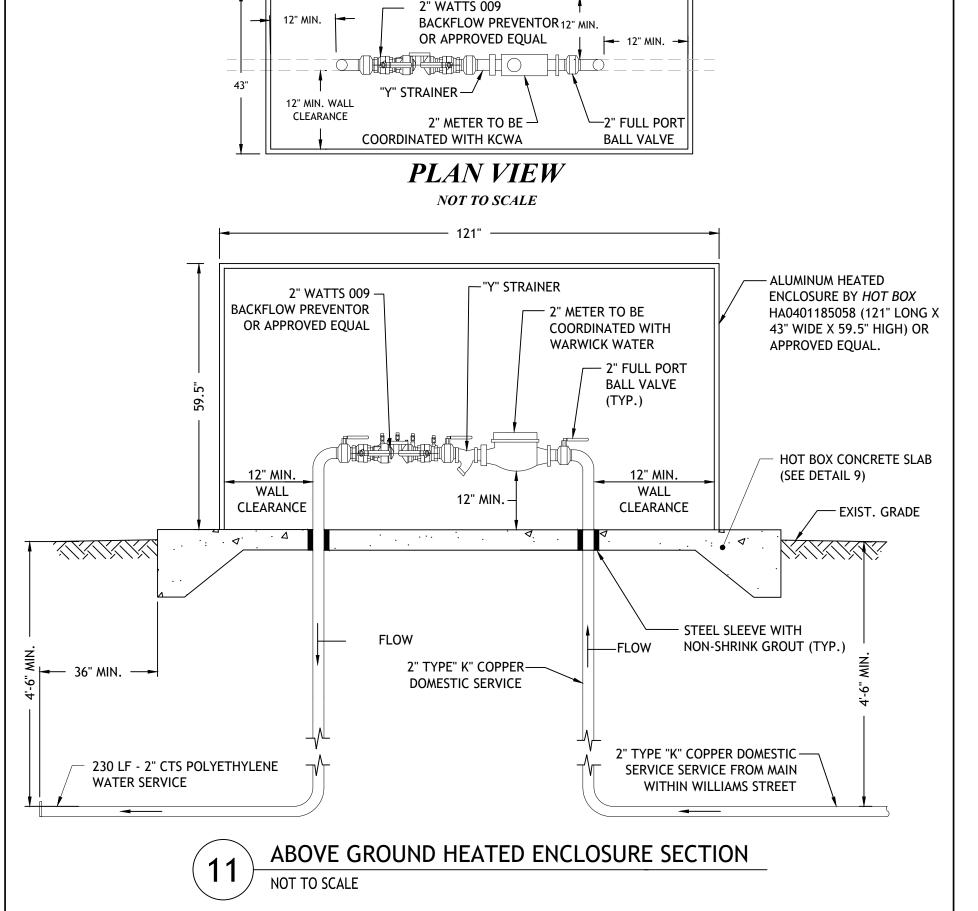


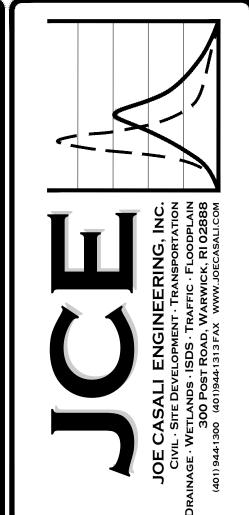
- 2. ALL FENCING MATERIALS SHALL BE IN ACCORDANCE WITH SECTION 902 OF THE RHODE ISLAND STANDARD SPECIFICATIONS.
- FENCE MESH TO BE SECURED TO TOP RAIL AND CORNER POSTS USING TIE WIRES SPACED 12" ON CENTER.
 PRIVACY SLATS TO BE INSTALLED AT THE COMPLETION OF CONSTRUCTION. PRIVACY SLATS SHALL BE GREEN AND SHALL
- BE BOTTOM-LOCKING AS MANUFACTURED BY PDS FENCE PRODUCTS INC. OR APPROVED EQUAL.

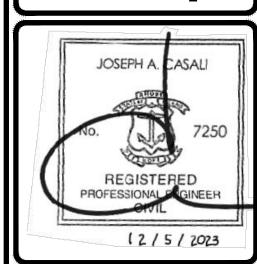
13 CHAIN-LINK FENCE DETAIL

NOT TO SCALE









EENWICH BAY TOWNHOUSE 5 WILLIAMS STREET WARWICK, RHODE ISLAND

REVISIONS:
NO. DATE. DESCRIPTION
R1 1/9/22 REV. SETBACKS
R2 7/2023 PERMIT SET
R3 12/2023 CITY COMMENTS

DESIGNED BY: WMLJR
DRAWN BY: SEP
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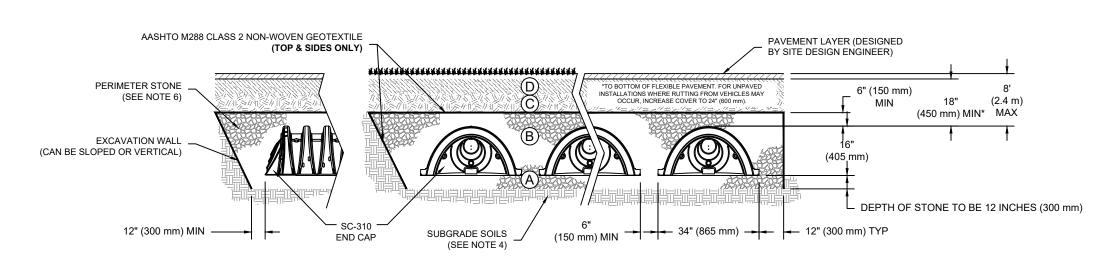
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DETAILS I

SHEET 7 OF 9

ACCEPTABLE FILL MATERIALS: STORMTECH SC-310 CHAMBER SYSTEMS COMPACTION / DENSITY AASHTO MATERIAL MATERIAL LOCATION DESCRIPTION CLASSIFICATIONS REQUIREMENT FINAL FILL: FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER PREPARE PER SITE DESIGN ENGINEER'S PLANS OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT PAVED INSTALLATIONS MAY HAVE STRINGENT GRADE ABOVE. NOTE THAT PAVEMENT SUBBASI SUBGRADE REQUIREMENTS. MATERIAL AND PREPARATION REQUIREMENTS MAY BE PART OF THE 'D' LAYER BEGIN COMPACTIONS AFTER 12" (300 mm) OI AASHTO M1451 MATERIAL OVER THE CHAMBERS IS REACHED A-1, A-2-4, A-3 OMPACT ADDITIONAL LAYERS IN 6" (150 mm) MA INITIAL FILL: FILL MATERIAL FOR LAYER 'C' GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% STARTS FROM THE TOP OF THE EMBEDMENT LIFTS TO A MIN. 95% PROCTOR DENSITY FOR FINES OR PROCESSED AGGREGATE. STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE WELL GRADED MATERIAL AND 95% RELATIVE TOP OF THE CHAMBER, NOTE THAT PAVEMENT MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU DENSITY FOR PROCESSED AGGREGATE AASHTO M43 MATERIALS. ROLLER GROSS VEHICLE WEIGHT SUBBASE MAY BE A PART OF THE 'C' LAYER. OF THIS LAYER. 3 357 4 467 5 56 57 6 67 68 7 78 8 8 NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC 9, 10 FORCE NOT TO EXCEED 20,000 lbs (89 kN). **EMBEDMENT STONE: FILL SURROUNDING THE** AASHTO M43 CHAMBERS FROM THE FOUNDATION STONE ('A' CLEAN, WASHED, CRUSHED, ANGULAR STONE NO COMPACTION REQUIRED. 3, 357, 4, 467, 5, 56, 57 LAYER) TO THE 'C' LAYER ABOVE. **FOUNDATION STONE:** FILL BELOW CHAMBERS AASHTO M431 PLATE COMPACT OR ROLL TO ACHIEVE A FLAT CLEAN, WASHED, CRUSHED, ANGULAR STONE FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) 3, 357, 4, 467, 5, 56, 57 SURFACE, 2 3 OF THE CHAMBER. PLEASE NOTE THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".

STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION

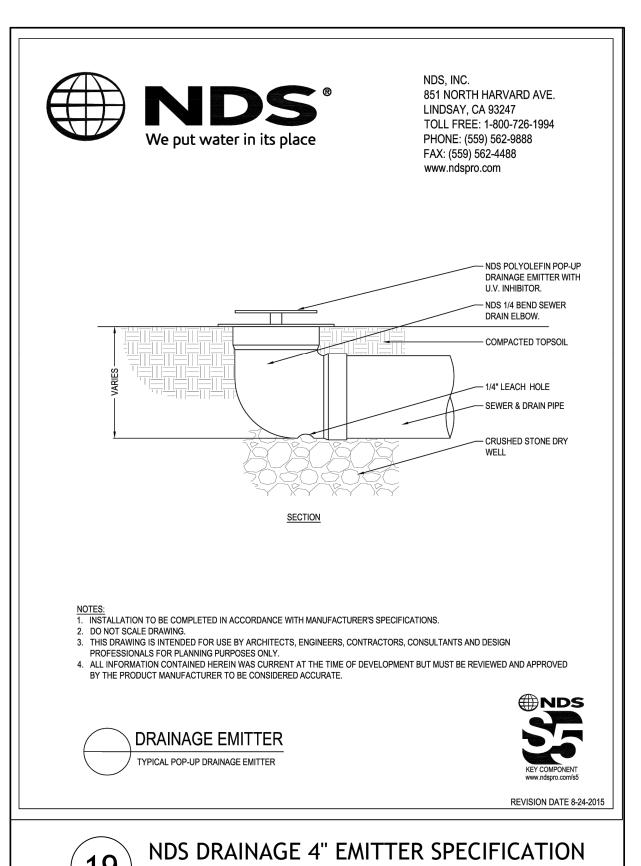


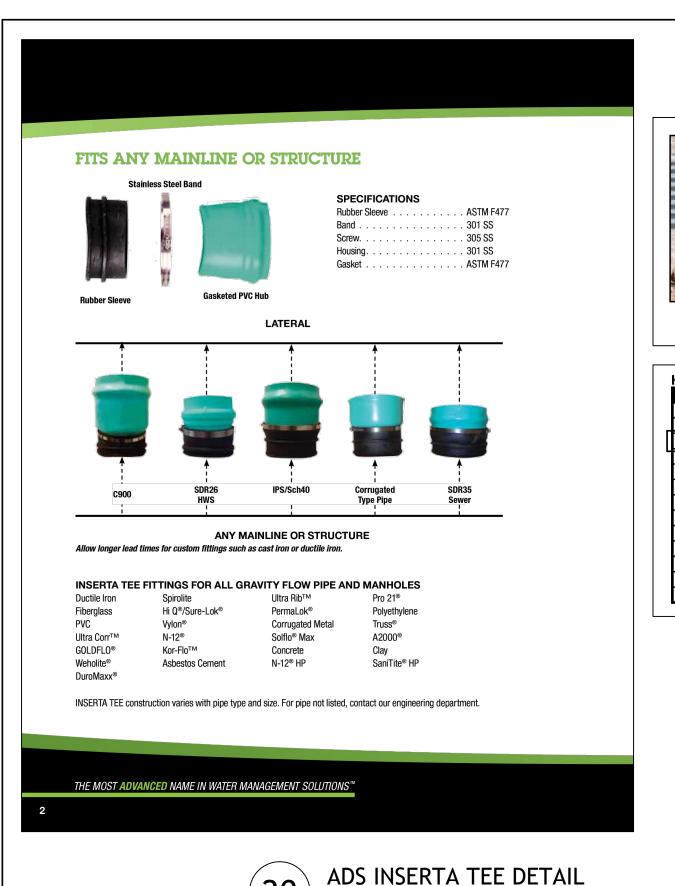
- 1. SC-310 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS", OR ASTM "STANDARD SPECIFICATION FOR POLYETHYLENE (PE) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- 2. SC-310 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION

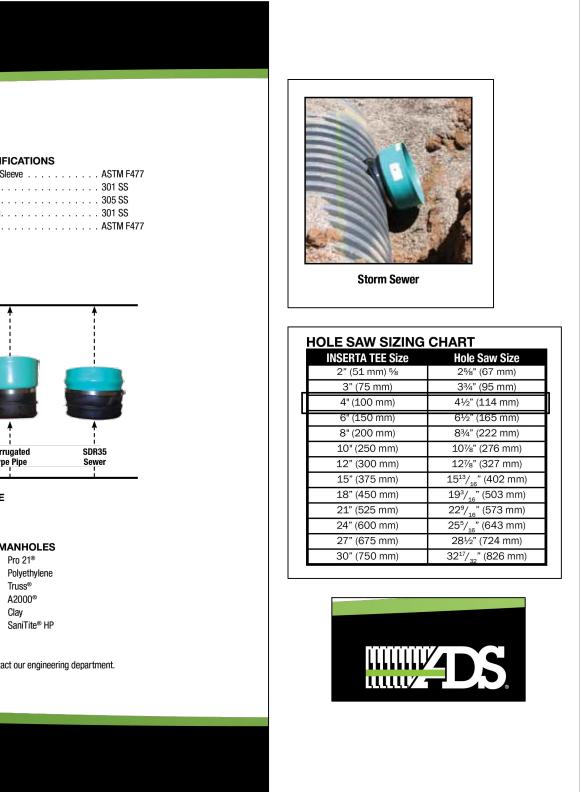
EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.

- 3. "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS
- 4. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH
- CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS. 5. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
- 6. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION

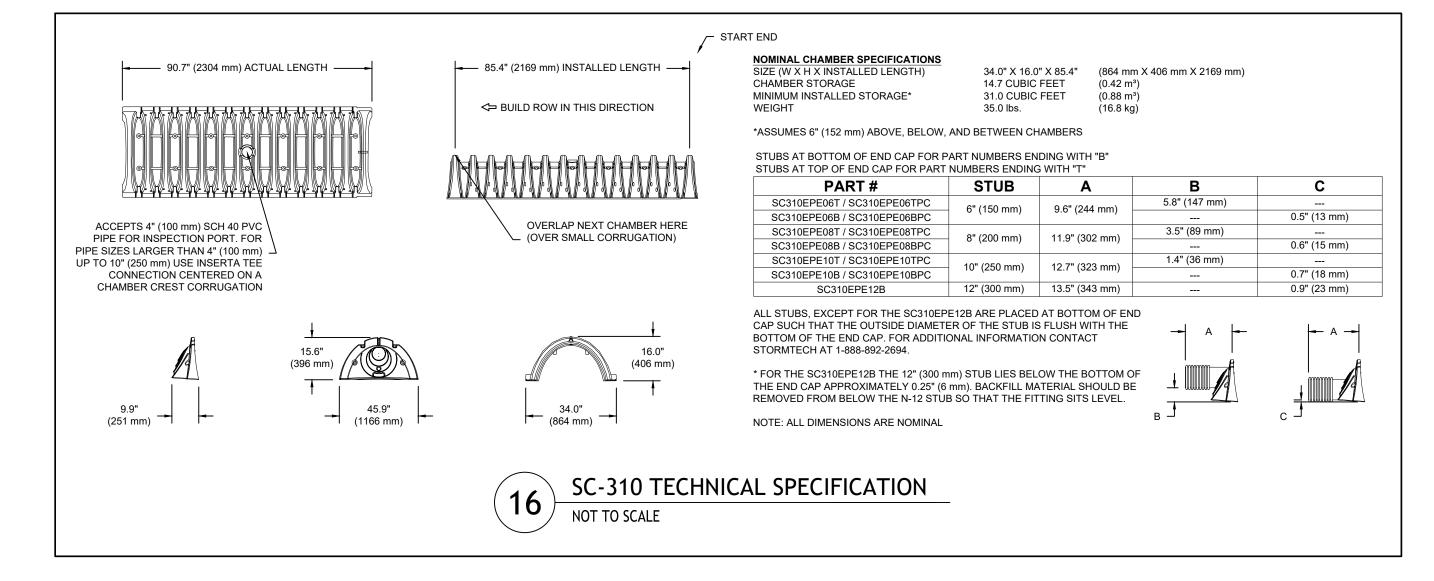


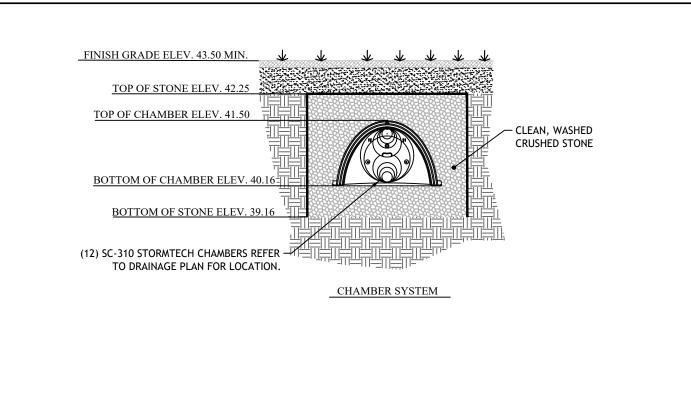


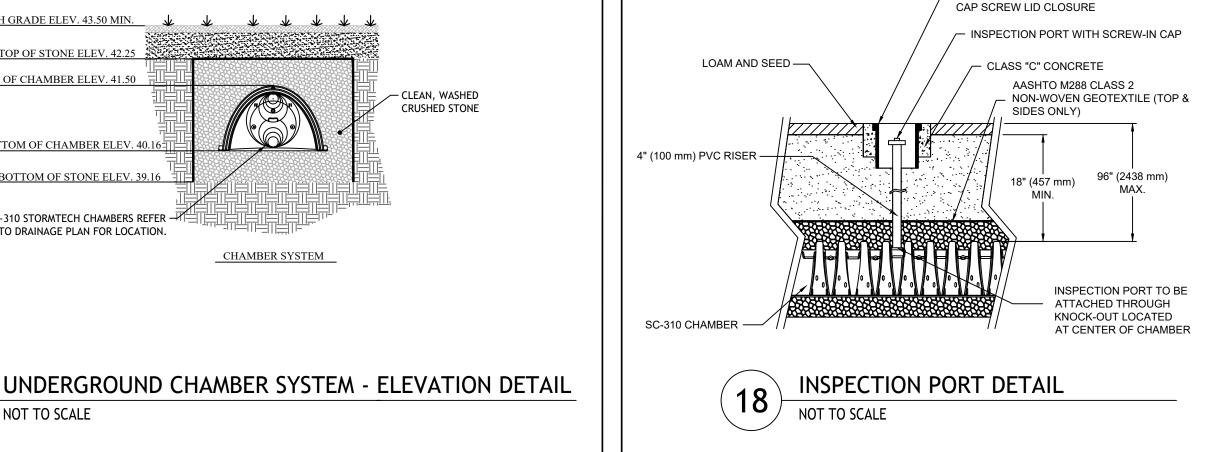




1 OF







STORMTECH GENERAL NOTES

- STORMTECH LLC ("STORMTECH") REQUIRES INSTALLING CONTRACTORS TO USE AND UNDERSTAND STORMTECH'S LATEST INSTALLATION INSTRUCTIONS PRIOR TO BEGINNING SYSTEM INSTALLATION.
- OUR TECHNICAL SERVICES DEPARTMENT OFFERS INSTALLATION CONSULTATIONS TO INSTALLING CONTRACTORS. CONTACT OUR TECHNICAL SERVICES REPRESENTATIVE AT LEAST 30 DAYS PRIOR TO SYSTEM INSTALLATION TO ARRANGE A PRE-INSTALLATION CONSULTATION. OUR REPRESENTATIVES CAN THEN ANSWER QUESTIONS OR ADDRESS COMMENTS ON THE STORMTECH CHAMBER SYSTEM AND INFORM THE INSTALLING CONTRACTOR OF THE MINIMUM INSTALLATION REQUIREMENTS BEFORE BEGINNING THE SYSTEM'S CONSTRUCTION. CALL 1-888-892-2694 TO SPEAK TO A TECHNICAL SERVICE REPRESENTATIVE OR VISIT **WWW.STORMTECH.COM** TO RECEIVE A COPY OF OUR INSTALLATION INSTRUCTIONS.
- STORMTECH'S REQUIREMENTS FOR SYSTEMS WITH PAVEMENT DESIGN (ASPHALT, CONCRETE PAVERS, ETC.): MINIMUM COVER IS 18 INCHES NOT INCLUDING PAVEMENT: MAXIMUM COVER IS 96 INCHES INCLUDING PAVEMENT. FOR INSTALLATIONS THAT DO NOT INCLUDE PAVEMENT, WHERE RUTTING FROM VEHICLES MAY OCCUR, MINIMUM REQUIRED COVER IS 24 INCHES, MAXIMUM COVER IS 96
- 4. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE DESIGN 5.
- 5. AASHTO M288 CLASS 2 NON-WOVEN GEOTEXTILE (FILTER FABRIC) MUST BE USED AS INDICATED IN THE PROJECT PLANS.
- 6. STONE PLACEMENT BETWEEN CHAMBERS ROWS AND AROUND PERIMETER MUST FOLLOW INSTRUCTIONS AS INDICATED IN THE MOST CURRENT VERSION OF STORMTECH'S INSTALLATION INSTRUCTIONS.
- BACKFILLING OVER THE CHAMBERS MUST FOLLOW REQUIREMENTS AS INDICATED IN THE MOST CURRENT VERSION OF STORMTECH'S
- THE CONTRACTOR MUST REFER TO STORMTECH'S INSTALLATION INSTRUCTIONS FOR A TABLE OF ACCEPTABLE VEHICLE LOADS AT VARIOUS DEPTHS OF COVER. THIS INFORMATION IS ALSO AVAILABLE AT STORMTECH'S WEBSITE: WWW.STORMTECH.COM. THE CONTRACTOR IS RESPONSIBLE FOR PREVENTING VEHICLES THAT EXCEED STORMTECH'S REQUIREMENTS FROM TRAVELING ACROSS OR PARKING OVER THE STORMWATER SYSTEM. TEMPORARY FENCING, WARNING TAPE AND APPROPRIATELY LOCATED SIGNS ARE COMMONLY USED TO PREVENT UNAUTHORIZED VEHICLES FROM ENTERING SENSITIVE CONSTRUCTION AREAS.
- THE CONTRACTOR MUST APPLY EROSION AND SEDIMENT CONTROL MEASURES TO PROTECT THE STORMWATER SYSTEM DURING ALL PHASES OF SITE CONSTRUCTION PER LOCAL CODES AND DESIGN ENGINEER'S SPECIFICATIONS.
- 10. STORMTECH PRODUCT WARRANTY IS LIMITED. SEE CURRENT PRODUCT WARRANTY FOR DETAILS. TO ACQUIRE A COPY CALL STORMTECH AT 1-888-892-2694 OR VISIT WWW.STORMTECH.COM.

STORMWATER CHAMBER SPECIFICATIONS

- CHAMBERS SHALL BE STORMTECH SC-310.
- 2. CHAMBERS SHALL BE MANUFACTURED FROM VIRGIN POLYPROPYLENE OR POLYETHYLENE RESINS.
- 3. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORT PANELS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
- 4. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
- CHAMBERS SHALL MEET ASTM F2922 (POLYETHYLENE) OR ASTM F2418-16 (POLYPROPYLENE), "STANDARD SPECIFICATION FOR THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- 6. CHAMBERS SHALL BE DESIGNED AND ALLOWABLE LOADS DETERMINED IN ACCORDANCE WITH ASTM F2787. "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- MANUFACTURER SHALL SUBMIT THE FOLLOWING UPON REQUEST TO THE SITE DESIGN ENGINEER FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE:

ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. THE CHAMBER

- A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY AASHTO FOR THERMOPLASTIC PIPE.
- A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET. THE 50 YEAR CREEP MODULUS DATA SPECIFIED IN ASTM F2418 OR ASTM F2922 MUST BE USED AS PART OF THE AASHTO STRUCTURAL EVALUATION TO VERIFY LONG-TERM PERFORMANCE.
- c. STRUCTURAL CROSS SECTION DETAIL ON WHICH THE STRUCTURAL EVALUATION IS BASED.
- 8. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

NOTES FOR THE INSTALLATION OF THE SC-310 SYSTEM

STORMTECH SC-310 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.

- FLOOR BOX FRAME AND LID W/S.S.

- STORMTECH SC-310 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
- CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS.
- STORMTECH RECOMMENDS 3 BACKELL METHODS: STONESHOOTER LOCATED OFF THE CHAMBER BED
- BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE. BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
- THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
- JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
- MAINTAIN MINIMUM 6" SPACING BETWEEN THE CHAMBER ROWS. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4-2".
- 8. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
- ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.
- NOTES FOR CONSTRUCTION EQUIPMENT
- STORMTECH SC-310 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
- THE USE OF CONSTRUCTION EQUIPMENT OVER SC-310 CHAMBERS IS LIMITED:
- NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS. NO RUBBER TIRED LOADERS, DUMP TRUCKS, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
- WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH SC-310/SC-740/DC-780
- 3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO THE CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

REGISTERED

12/5/2023

PROFESSIONAL

NO. DATE. DESCRIPTION R1 1/9/22 REV. SETBACKS R2 7/2023 PERMIT SET R3 12/2023 CITY COMMENTS

ESIGNED BY:	WMLJR
RAWN BY:	SEP
HECKED BY:	JAC
ATE:	20-10b
ROJECT NO:	NOV. 2022

PRELIMINARY, NOT FOR CONSTRUCTION

DETAILS II

SHEET 8 OF 9

3.22 PRESSURE TEST:

3.22.1 ALL SERVICES, WATER MAINS, BYPASS PIPING AND APPURTENANCES MUST BE INSTALLED PRIOR TO COMMENCEMENT OF ANY TEST. A PRESSURE TEST SHALL BE

CONDUCTED ON ALL COMPLETED WATER LINES PRIOR TO ACCEPTANCE. THE PROPOSER, AT NO COST TO THE KENT COUNTY WATER AUTHORITY, SHALL ACCOMPLISH THE PRESSURE TEST. AN AUTHORIZED REPRESENTATIVE OF THE KENT COUNTY WATER AÚTHORITY SHALL WITNESS THE TEST. EACH VALVE SECTION OF THE MAIN SHALL BE FILLED SLOWLY WITH WATER AT A RATE NO GREATER THAN ONE FOOT OF PIPE SECTION PER SECOND. ALL AIR SHALL BE RELEASED VIA CORPORATION STOPS, HYDRANTS, AND INSTALLED AUTOMATIC AIR RELEASE FITTINGS. ALL AIR MUST BE REMOVED AND THE FULL PIPE SHALL SIT IDLE FOR A PERIOD OF 24 HOURS PRIOR TO COMMENCEMENT OF THE PRESSURE TEST. PIPING INSTALLATIONS GREATER THAN 1,000 FEET SHALL BE ACCOMPLISHED IN SECTIONS NO GREATER THAN L.000 FEET THE TEST PRESSURE SHALL BE BROUGHT UP TO AT LEAST 50% HIGHER THAN THE NORMAL ANTICIPATED WORKING PRESSURE, OR 150 PSI, WHICHEVER IS GREATER, AND

MAINTAINED FOR A CONTINUOUS TWO (2) HOUR PERIOD. AN AUTHORIZED REPRESENTATIVE OF THE KENT COUNTY WATER AUTHORITY SHALL WITNESS THE TEST. ANY LOSS OF PRESSURE INDICATES A LEAK, AND NO PIPE INSTALLATION WILL BE ACCEPTED WITH ANY LEAKAGE. 3.22.4 PROPER THRUSTING OF ALL PIPEFITTING, CAPS, HYDRANTS, AND APPURTENANCES SHALL BE PROVIDED TO RESIST THE IMPOSED TEST PRESSURE.

3.23 CHLORINATION/DISINFECTION:
3.23.1 ALL NEW OR REPAIRED POTABLE WATER SYSTEM DISTRIBUTION MAINS, SERVICE PIPE AND THE NECESSARY CONNECTING PIPES, FITTINGS, CONTROL VALVES, AND ALL APPURTENANCES IN OR ADJACENT TO ANY RESIDENCE, BUILDING OR PREMISES SHALL BE PURGED OF DELETERIOUS MATTER AND SHALL BE DISINFECTED PRIOR TO UTILIZATION OR PERMANENT CONNECTION TO THE KENT COUNTY WATER AUTHORITY SYSTEM. THAT PORTION OF THE CUSTOMER'S SERVICE PIPE AFTER THE CURB STOP SHALL BE DISINFECTED UNDER THE SUPERVISION OF THE LOCAL PLUMBING OFFICIAL. THE OWNER MUST PROVIDE WRITTEN LABORATORY CERTIFIED DOCUMENTATION OF THE DISINFECTION TEST RESULTS TO THE KENT COUNTY WATER AUTHORITY BEFORE MAKING ANY PERMANENT CONNECTION TO THE KENT COUNTY WATER AUTHORITY SYSTEM OR BEFORE REACTIVATION OF ANY EXISTING WATER SERVICE CAN BE AUTHORIZED. PLEASE REFER TO APPENDICES FOR PROGRAM REQUIREMENTS OF THE CUSTOMER WATER SERVICE DISINFECTION POLICY.

THE PROPOSER OR THE CONTRACTOR FOR THE PROPOSER, IN ACCORDANCE WITH CHAPTER 5, DISTRIBUTION SYSTEM CHLORINATION, AMERICAN WATER WORKS ASSOCIATION MANUAL #20. SHALL PERFORM CHLORINATION. TABLET CHLORINATION SHALL NOT BE ALLOWED. THE OWNER OR CUSTOMER IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH THE DISINFECTION PROCESS OR PROCEDURE. 3.23.4 THE DISINFECTION MUST RESULT IN ELIMINATING FROM THE VARIOUS PARTS OF THE NEW PIPE LINE ANY EVIDENCE OF THE EXISTENCE, THEREIN, OF BACTERIA INDICATIVE OF ANY CONTAMINATION, AS DETERMINED BY TESTS OF THE BACTERIAL CONTENT OF SAMPLES OF WATER TAKEN FROM THE NEW WATER MAIN. THE DISINFECTION MAY BE ACCOMPLISHED BY INTRODUCING INTO ALL THE VARIOUS PARTS OF THE NEW WATER MAINS, A LIQUID SOLUTION CONTAINING L% AVAILABLE

CHLORINE IN SUCH VOLUME THAT THE RATE OF DOSAGE TO THE WATER MAINS SHALL BE AT LEAST 50 PARTS PER MILLION OF AVAILABLE CHLORINE. TABLET CHLORINATION IS NOT ALLOWED. THE CONTACT PERIOD FOR THIS DISINFECTION SHALL BE AT LEAST 24 HOURS, AND A LONGER PERIOD WILL BE REQUIRED IF TESTS OF RESIDUAL CHLORINE SHOW IT TO BE NECESSARY FOR PROPER DISINFECTION. THE NEW WATER SYSTEM SHALL BE FLUSHED OUT AFTER DISINFECTION AND REFILLED WITH FRESH WATER. ALL CHLORINATED WATER USED IN THE DISINFECTION

PROCESS SHALL BE DE-CHLORINATED PRIOR TO DISCHARGE TO THE SURROUNDING AREA. WATER MUST SIT IN THE MAIN FOR AT LEAST 24 HOURS PRIOR TO TAKING A TEST SAMPLE. WATER UTILIZED FOR THIS PURPOSE, FLUSHING OR PRESSURE TESTING WHICH IS OBTAINED DIRECTLY FROM THE KENT COUNTY WATER AUTHORITY SYSTEM, MUST FLOW THROUGH AN ISOLATED CONNECTION TO THE KENT COUNTY WATER AUTHORITY SYSTEM VIA AN APPROVED METER, TESTABLE BACKFLOW PREVENTION DEVICE AND JUMPER LINE. THE CONTRACTOR SHALL MAKE ALL NECESSARY ARRANGEMENTS FOR SECURING THE WATER FOR TEST PURPOSES AND SHALL BEAR THE EXPENSE OF THESE ARRANGEMENTS. THE INSTALLER SHALL FURNISH AND INSTALL SUITABLE TEMPORARY TESTING PLUGS, CAPS, PUMPS, PIPE CONNECTIONS AND OTHER APPURTENANCES, AS NECESSARY, TO OBTAIN SAMPLES AT POINTS NO

FURTHER THAN 1.000 FEET APART. 3.23.7 AFTER FINAL FLÚSHING AND BEFORE THE NEW WATER MAIN IS CONNECTED TO THE DISTRIBUTION SYSTEM, TWO CONSECUTIVE SETS OF ACCEPTABLE SAMPLES FOR COLIFORM BACTERIA AND HETEROTROPHIC PLATE COUNT (HPC), TAKEN 24 HOURS APART, SHALL BE COLLECTED FROM THE TERMINATION OF THE NEW MAIN. AT LEAST ONE SAMPLE SHALL BE COLLECTED EVERY 1000 FT. OF NEW MAIN, PLUS ONE SET OF TWO SAMPLES FROM THE END OF THE LINE. AT LEAST ONE SET OF TWO SAMPLES SHALL BE TAKEN FROM EACH BRANCH. SAMPLES SHALL BE COLLECTED BY KENT COUNTY WATER AUTHORITY EMPLOYEES, GIVEN A TWO-DAY NOTICE, AND TESTED BY A LABORATORY APPROVED BY KENT COUNTY WATER AUTHORITY. A FEE SHALL BE IMPOSED FOR THE SAMPLING TESTING FOR EACH TEST. THE FEE SHALL BE AT THE CURRENT RATE SCHEDULE IN EFFECT AT THE TIME OF TESTING. PAYMENT SHALL BE PRIOR TO SAMPLE COLLECTION BY THE KENT COUNTY WATER AUTHORITY. THE WATER SAMPLE TEST RESULTS MUST INDICATE THAT THE WATER QUALITY IN THE NEW MAIN IS CONSISTENT IN QUALITY WITH THE KENT COUNTY WATER AUTHORITY SYSTEM WATER.

CONFIGURATION MANAGEMENT FOR THE SYSTEM WIDE STANDARDIZATION OF REPAIR PARTS, APPURTENANCES, AND CONSTRUCTION MATERIALS ARE NECESSARY TO MAINTAIN REASONABLE SPARE PARTS INVENTORIES FOR EMERGENCY REPAIRS AND CONTROL THE RELATED COST TO THE BENEFIT OF THE CUSTOMER. FOR THESE REASONS, THE KENT COUNTY WATER AUTHORITY HAS SELECTED MATERIAL STANDARDS THAT PROVIDE THE GREATEST SERVICE LIFE, RELIABILITY AND ARE CONSISTENT WITH OVERALL INFRASTRUCTURE COMPATIBILITY. ALL MATERIALS USED WITHIN THE KENT COUNTY WATER AUTHORITY SHALL BE MADE IN UNITED STATES OF AMERICA OR SPECIFICALLY APPROVED OTHERWISE AND CONFORM TO THE STANDARD REQUIREMENTS CONTAINED IN THIS SECTION.

SERVICE PIPE SIZES ¾ TO 2 INCH SHALL BE EITHER COPPER OR H.D.P.E. PIPE. COLOR MUST BE BLUE WITH A VIRGIN CLEAR NATURAL CENTER. CONTINUOUS IDENTIFICATION MARKINGS OVER THE ENTIRE LENGTH OF THE PIPE WITH SEALED ENDS AND COILED IN ROLLS FROM 100 FT. MINIMUM. WHEN H.D.P.E. SERVICE PIPE IS CHOSEN, A SOLID STAINLESS STEEL INSERT SHALL BE INSTALLED AT EACH CONNECTION AND A 12-FOOT TYPE "K" COPPER WHIP SHALL BE INSTALLED AT THE POINT OF ENTRY INTO ANY BUILDING OR STRUCTURE. AND ON THE INLET AND OUTLET OF A METER PIT 4.2.1.1 H.D.P.E. SHALL CONFORM TO ASTM D1248 TYPE III, GRADE P34, CLASS A, CATEGORY 5, COLOR BLUE WITH VIRGIN CLEAR NATURAL CENTER. AWWA C901, 200

4.2.1.2 COPPER PIPE SHALL BE TYPE "K" COPPER TUBING DESIGNED FOR POTABLE WATER SERVICE ANSI/ASTM B88. 4.2.2 SERVICES 3 INCH AND ABOVE SHALL BE DUCTILE IRON AND CONFORM TO THE REQUIREMENTS FOR MAIN MATERIALS AND INSTALLATION.

ALL METERS SHALL BE COMPATIBLE WITH THE SYSTEM UTILIZED BY THE KENT COUNTY WATER AUTHORITY. THE NEPTUNE E-CODER R-900: SYSTEM IS STANDARDIZED ALL METERS ARE TO READ IN CUBIC FEET. MUST BE CAPABLE OF BEING READ THE RADIO FREQUENCY SYSTEM IN PLACE AT THE KENT COUNTY WATER AUTHORITY. REGISTER SHALL CONTAIN A 9-DIGIT LOCAL REGISTRATION AND 4-8 DIGITS CAN BE COMMUNICATED FOR BILLING PURPOSES. ANY METER LOCATED IN A METER PIT OR CHAMBER SHALL BE EQUIPPED WITH REGISTERS DESIGNED SPECIFICALLY FOR MOISTURE PROTECTION AND "PIT" STYLE ALL FIRE SERVICE METERS SHALL BE IN ACCORDANCE WITH THE KENT COUNTY WATER AUTHORITY AND NFPA STANDARDS WITH UL/FM APPROVED STRAINER DESIGNED FOR FIRE SERVICE.

AIR RELEASE MANHOLES SHALL BE WATERTIGHT PRE-CAST CONCRETE CONSTRUCTED WITH WATERTIGHT CAST IRON MANHOLE FRAME AND DIAMOND CHECK PATTERN COVER. COVER SHALL HAVE THE WORD "WATER" CAST UPON IT IN 4 INCH CAPITAL LETTERS. THE CHAMBER, FRAME, COVER, AND STRUCTURAL COMPONENTS SHALL BE DESIGNED TO WITHSTAND A H-20 WHEEL LOADING. THE FRAME AND WATERTIGHT COVER ASSEMBLY MUST CONFORM TO THE REQUIREMENTS OF THE KENT COUNTY WATER AUTHORITY FOR SIZE AND DIMENSION. MANHOLE SHALL BE OUTFITTED WITH CORROSION RESISTANT, NON-SLIP STEPS.

RESTRAINING DEVICES SHALL BE UTILIZED ON ALL MAINS. THRUST BLOCKS SHALL BE CONSTRUCTED FROM CONCRETE 3000 PSI AT 28 DAYS, SIZED ACCORDING TO THE SIZE OF PIPELINE, TYPE OF FITTING, WATER PRESSURE AND THE CHARACTERISTICS OF THE SOIL. THE CONCRETE SHALL BE PROPERLY FORMED AS TO SLOPE FOR THE GIVEN APPLICATION AND BEARING WIDTH. THE CONCRETE SHALL BE IN CONTACT ONLY WITH THE FITTING, NOT WITH THE PIPE ITSELF, FASTENERS OR THE JOINT CONCRETE CURING TIME SHALL BE A MINIMUM OF 7 DAYS. THRUST RESTRAINT MAY BE VIA RESTRAINED JOINT, DUCTILE IRON PIPE MEETING ANSI/AWWA C151/A21.51 AND ANSI/AWWA C11/A21. RESTRAINED JOINT PIPE LENGTHS (RESTRAINED LENGTH) SHALL BE SUFFICIENT TO RESTRAIN THRUST IMPARTED BY 1-1/2 TIMES THE ANTICIPATED WORKING PRESSURE BUT NOT LESS THAN

GLAND AND RESTRAINT COMPONENTS MADE FROM DUCTILE IRON AND SHALL HAVE A BITUMINOUS OUTSIDE COATING IN ACCORDANCE WITH ANSI/AWWA C151/A21.5 AND ANSI/AWWA C153/A21.53 RESPECTIVELY. CAPABLE OF BEING USED WITH STANDARDIZED MECHANICAL JOINT BELL CONFORMING TO AWWA C111 AND C153. MULTIPLE WEDGE STYLE RESTRAINT MECHANISM WITH POWDER COATED HEAT-TREATED DUCTILE IRON WEDGES. PROPER ACTUATION ENSURED BY TOROUE LIMITING TWIST OFF NUTS. MINIMUM SAFETY FACTOR 2 TO 1. RESTRAINED JOINTS SHALL BE SUITABLE FOR 150 PSI WORKING PRESSURE AND FABRICATED OF HEAVY SECTION DUCTILE IRON CASTING. GASKETS SHALL MEET THE MATERIAL REQUIREMENTS OF ANSI/AWWA C111 FOR MECHANICAL JOINT GASKETS. BOLTS AND NUTS AS REQUIRED SHOULD BE LOW CARBON STEEL CONFORMING TO ASTM A307, GRADE B.

ALL DUCTILE-IRON PIPE AND APPURTENANCES SHALL BE FROM A SINGLE MANUFACTURER SOURCE. FOREIGN PIPE FITTINGS AND GASKETS ARE STRICTLY FORBIDDEN. DUCTILE IRON PIPE SHALL CONFORM TO ANSI/AWWA C151/A21.51, ANSI/AWWA C150/A21.50 CLASS 52 DOUBLE CEMENT MORTAR LINED. GASKETS SHALL CONFORM TO ANSI/AWWA C111/A21.1. ALL PIPES SHALL HAVE A BITUMINOUS OUTSIDE COATING IN ACCORDANCE WITH ANSI/AWWA C151/A21.51 AND ANSI/AWWA C153/A21.53 RESPECTIVELY. ALL PIPES SHALL BE CEMENT-MORTAR LINED AND SEAL COATED IN ACCORDANCE WITH ANSI/AWWA C104/A21.14 EXCEPT THE LINING THICKNESS SHALL BE TWICE THAT SPECIFIED. JOINTS FOR PIPE SHALL BE PUSH-ON (TYTON STYLE ONLY) OR MECHANICAL JOINT CONFORMING TO ANSI/AWWA C111 ALL MECHANICAL JOINT PIPES SHALL BE SUPPLIED WITH ACCESSORIES. RESTRAINED JOINTS SHALL BE SUÍTABLE FOR 150 PSI WORKING PRESSURE AND FABRICATED OF HEAVY SECTION DUCTILE IRON CASTING. GASKETS SHALL MEET THE MATERIAL REQUIREMENTS OF ANSI/AWWA AND MADE IN THE USA.

CLASS: SPECIAL THICKNESS CLASS 52. DOUBLE CEMENT MORTAR MEETING ANSI/AWWA C151/A21.5. END JOINTS: PUSH ON - TYTON STYLE ONLY - MEETING ANSI/AWWA C111/A21.51. MECHANICAL JOINT - MEETING ANSI/AWWA C111/A21.11. EXTERIOR: ANSI/AWWA C104/A21.4. INTERIOR: ALL REQUIREMENTS OF EPA FOR POTABLE WATER.

NITRILE (IN CONTAMINATED SOIL)

DUCTILE IRON MEETING ANSI/AWWA C151/A21.51 ANSI/AWWA C150/A21.50.

RUBBER MEETING ANSI/AWWA C111/A21.11. NITRILE (IN CONTAMINATED SOIL). DUCTILE IRON FITTINGS SHALL CONFORM TO ANSI/AWWA C153/A21.53. FOREIGN FITTINGS, GASKET GLANDS AND ACCESSORIES ARE STRICTLY FORBIDDEN. ALL FITTINGS SHALL HAVE A BITUMINOUS OUTSIDE COATING IN ACCORDANCE WITH ANSI/AWWA C151/A21.51 AND ANSI/AWWA C153/A21.53 RESPECTIVELY. ALL FITTINGS SHALL BE

4 INCH TO 12 INCH DUCTILE IRON COMPACT MEETING ANSI/AWWA C153/A21.53. 16 INCH AND LARGER DUCTILE IRON MEETING ANSI/AWWA C153/A21.53 OR ANSI/AWWA C110/A21.10. PRESSURE CLASS: PIPE FITTINGS SHALL HAVE A PRESSURE RATING OF 350 FOR 24-INCH AND SMALLER AND 250 PSI FOR 30-INCH AND LARGER. FITTINGS SHALL AT A MINIMUM HAVE THE SAME PRESSURE RATING AS THE CONNECTING PIPE. RUBBER MEETING ANSI/AWWA C111/A21.11.

CEMENT-MORTAR LINED AND SEAL COATED IN ACCORDANCE WITH ANSI/AWWA C104/A21.14 EXCEPT THE LINING THICKNESS SHALL BE TWICE THAT SPECIFIED. JOINTS FOR

FITTINGS SHALL BE MECHANICAL JOINT CONFORMING TO ANSI/AWWA C111. ALL MECHANICAL JOINT FITTINGS SHALL BE SUPPLIED WITH GLANDS AND ACCESSORIES

VALVES SHALL BE CAST IRON OR DUCTILE IRON 250-PSI WORKING PRESSURE. OPERATING STEM SHALL BE PROVIDED WITH A MINIMUM OF TWO (2) O-RING STEM SEALS BONNET AND GLAND BOLTS/WASHERS SHALL BE STAINLESS STEEL. WEDGES SHALL BE FULLY ENCAPSULATED. THE INTERIOR AND EXTERIOR SÚRFACES OF ALL CAS IRON OR DUCTILE IRON COMPONENTS SHALL BE FUSION BOND EPOXY COATED, 8 MILS MINIMUM THICKNESS. EPOXY COATING MUST BE UNDAMAGED WITH NO CHIPS OR ABRASIONS. FIELD TOUCH-UP OF INTERIOR COATING IS NOT ALLOWED. FIELD TOUCH-UP OF EXTERIOR SURFACES SHALL BE IN ACCORDANCE WITH MANUFACTURES RECOATING SPECIFICATIONS ONLY. CONTRACTORS SHALL USE SPECIAL HANDLING AND INSTALLATION PRECAUTIONS WITH THE USE OF EPOXY COATED VALVES AS NECESSARY TO ENSURE THAT NO COATING SYSTEM DAMAGE OCCURS. AT A MINIMUM FIBER SLINGS OR BELTS SHALL BE USED FOR ALL HANDLING. ALL EPOXY-COATED VALVES SHALL BE PALLETIZED AND PROPERLY SHRINK-WRAPPED UPON DELIVERY TO ASSURE COATING SYSTEM INTEGRITY IS NOT COMPROMISED. ALL EPOXY VALVES FOUND MISHANDLED AT DELIVERY OR DURING INSTALLATION SHALL BE REJECTED AND REMOVED FROM THE JOB SITE. ALL VALVES SHALL BE MANUFACTURED TO MEET OR EXCEED AWWA C509 AND ISO 9000 ALONG WITH THE DESIGN AND OPERATING CHARACTERISTICS OF THE FOLLOWING DEVICES:

4.9.1.1 RESILIENT SEAT GATE 4 INCH TO 12 INCH: BURIED SERVICE NON-RISING STEM. ABOVE GRADE SERVICE OR PITS OS & Y WITH HAND WHEEL OR NON-RISING STEM WITH HAND WHEEL. LEFT OR RIGHT DEPENDING ON SYSTEM LOCATION. OPENING:

420 STAINLESS STEEL OR EQUAL WITH MINIMUM 60,000 PSI YIELD STRENGTH. STAINLESS STEEL, TYPE 304 FOR ALL OF THE VALVE.

INTERNAL & EXTÉRIOR TO BE COATED WITH FUSE BONDED HOLIDAY FREE EPOXY COATING MINIMUM 8 MILS NOMINAL THICKNESS MEETING OR COATINGS: EXCEEDING AWWA C550 FULLY RUBBER ENCAPSULATED CAST IRON, DUCTILE IRON OR BRONZE GATE MEETING AWWA C509.

2 INCH SQUARE OPERATING NUT WITH HEXAGON STAINLESS STEEL BOLT FASTENER. OPERATING NUT: STEM SEAL: MINIMUM TWO O-RING SEALS. CONNECTION: MECHANICAL JOINT.

4.9.1.2 BUTTERFLY 16" AND LARGER: RUBBER SEATED TIGHT CLOSING OR EXCEEDING AWWA C504 UNDERGROUND SERVICE. CLASS 150 OR 250 DEPENDING UPON SERVICE APPLICATION GRADE 18-8 TYPE 304 STAINLESS STEEL

VALVE VANE/DISC: DUCTILE IRON OR HIGH STRENGTH CAST IRON WITH EITHER MECHANICALLY FASTENED BUNA RUBBER SEAL OR TYPE 316 STAINLESS STEEL SEAL STAINLESS STEEL OR BUNA N RUBBER. RUBBER SEAT CAN BE EITHER BONDED OR MECHANICALLY FASTENED AND SHALL NOT INTERRUPT FLOW. DUAL LINK CONSTRUCTION WITHIN A SEALED HOUSING FOR UNDERGROUND USE DESIGNED FOR SUBMERGENCE IN WATER TO 25 FEET OF HEAD AND MEETING AWWA C504. VALVE NUT SHALL BE MINIMUM OF TWO-INCH SQUARE MADE OF DUCTILE IRON AND FASTENED TO STEM. OPERATOR TO BE TRAVELING NUT TYPE CAPABLE OF WITHSTANDING AN OVERLOAD INPUT TORQUE OF 450 FOOT-POUNDS WITHOUT DAMAGE TO THE VALVE LEFT OR RIGHT DEPENDING ON SYSTEM LOCATION.

GRADE 18-8 STAINLESS STEEL, TYPE 304 FOR ALL FASTENERS OF THE VALVE. **FASTENERS:** INTERIOR & EXTERIOR TO BE COATED WITH FUSE BONDED HOLIDAY FREE EPOXY MINIMUM THICKNESS 8 MILS NOMINAL MEETING OR EXCEEDING COATINGS: AWWA C-550. CONNECTION: MECHANICAL JOINT OR FLANGED.

4.9.1.3 TAPPING SLEEVES AND VALVES: VALVES SHALL BE FULL BODY AND FULL PORT TAPPING TYPE MEETING THE REQUIREMENTS PARAGRAPH 4.9.1.1 ABOVE. SLEEVES SHALL BE FULL PORT DUCTILE IRON OR GRADE 18-8 TYPE 304 STAINLESS STEEL. DUCTILE IRON SLEEVES SHALL BE OF THE SAME MANUFACTURER AS OF THE VALVE AND BITUMINOUS COATED. ALL SLEEVES SHALL BE MANUFACTURED TO MEET OR EXCEED THE DESIGN AND OPERATING CHARACTERISTICS OF ONE OF THE FOLLOWING DEVICES:

RESILIENT SEAT GATE VALVES DESIGNED SPECIFICALLY FOR TAPPING. STAINLESS STEEL SLEEVES SHALL USE GRID PATTERN VIRGIN RUBBER ASTM 2000, FULL 360-DEGREE PIPE COVERAGE. DUCTILE IRON SLEEVES SHALL USE MECHANICAL JOINT WITH RUBBER SEALS. MAXIMUM WORKING PRESSURE: 4 INCH-12 INCH 250 PSE, 16 INCH-24 INCH 200 PSI. FASTENER: GRADE 18-8 TYPE 304 STAINLESS STEEL.

4.9.1.4 SWING-CHECK: 4.9.1.4.1 SWING CHECK VALVES SHALL UTILIZE IRON-BODY BRONZE-MOUNTED DESIGN. THEY MAY EMPLOY METAL TO METAL OR COMPOSITION TO METAL SEAT CONSTRUCTION.

4.9.1.4.2 WORKING PRESSURE SHALL BE A MINIMUM OF 175 PSI FOR VALVES UP TO 12 INCH AND 150 PSI FROM 16 INCH TO 24 INCH. 4.9.1.4.3 SWING CHECK VALVES SHALL BE MOUNTED IN A HORIZONTAL POSITION. DIRECT ACCESS TO THE VALVE SHALL BE ACCOMPLISHED BY USING A PRE-CAST CONCRETE MANHOLE WITH HEAVY-DUTY CAST IRON MANHOLE FRAME AND SOLID COVER. CONCRETE STRUCTURE AND COVER SHALL BE CAPABLE OF WITHSTANDING AN ASHTO H-20 LOAD. THE COVER SHALL HAVE A DIAMOND CHECK PATTERN WITH THE WORD "WATER" (IN UPPER CASE LETTERS) CAST JPON IT. THE MANHOLE SHALL BE OUTFITTED WITH CORROSION RESISTANT, NON-SLIP, STEPS.

4.9.2.1 ALL VALVES (EXCEPT SWING-CHECK) SHALL BE EQUIPPED WITH A CAST IRON "BUFFALO" TYPE, ADJUSTABLE (SLIDING) VALVE ROAD BOX. THE UPPER PORTION SHALL BE 26 INCH LONG AND THE BOTTOM SECTION 48 INCH (MIN). COVERS SHALL BE 5-1/4" IN DIAMETER SOLID RING SEAT WITH THE WORD "WATER" (IN 4.9.2.2 THE UPPER PORTION OF THE BOX SHALL BE MANUFACTURED WITH A HEAVY FLANGE HAVING SUFFICIENT BEARING AREA TO PREVENT SETTLEMENT. THE LOWER

SECTION SHALL BE CONFIGURED TO ENCLOSE THE VALVE STUFFING BOX WITH AN INSIDE DIAMETER OF AT LEAST 4-1/4 INCH. THE INSTALLED BOX SHALL BE CAPABLE OF VERTICAL ADJUSTMENT OF A MINIMUM OF 6 INCH WHILE MAINTAINING AN OVERLAP OF A LEAST 4 INCH BETWEEN SECTIONS.

TO MAINTAIN SYSTEM WIDE STANDARDIZATION, HYDRANTS SHALL BE DRY BARREL TYPE WITH 5¼ INCH VALVE. HYDRANTS SHALL CONFORM TO THE "STANDARI

SPECIFICATIONS FOR FIRE HYDRANTS FOR ORDINARY WATER WORKS SERVICE," AWWA C-502, AND SHALL IN ADDITION MEET THE SPECIFIC REQUIREMENTS OF THE KENT COUNTY WATER AUTHORITY AS LISTED. HYDRANTS SHALL BE UL RATED FOR 250-PSI WORKING PRESSURE AND SERVICE INSTALLATION IN A TRENCH THAT WILL PROVIDE VARIOUS MINIMUM COVER. HYDRANTS SHALL BE ACCORDING TO MANUFACTURER'S STANDARD PATTERN UNLESS NOTED OTHERWISE AND OF STANDARD SIZE, AND SHALL BE EQUIPPED WITH 6 INCH MECHANICAL JOINT CONNECTION FOR 6" DUCTILE IRON PIPE, ONE 4 ½ INCH STEAMER NOZZLE AND TWO 2 ½ INCH HOSE NOZZLES, BRASS OR BRASS SLEEVED DRAINS, NATIONAL STANDARD THREAD, HYDRANT INLET CONNECTIONS. HYDRANTS SHALL BE OF THE FULL COMPRESSION DESIGN, OPENING AGAINST AND CLOSING WITH THE WATER PRESSURE. THE HYDRANTS SHALL BE DESIGNED TO PERMIT ROTARY MOVEMENT OF THE UPPER BARREL ANY NUMBER OF DEGREES REQUIRED TO EFFECT PROPER ALIGNMENT WITHOUT SHUTTING DOWN SERVICE OR REMOVING FLANGE BOLTS AND NUTS. HYDRANT MUST OPEN TURNING OPERATING NUT TO LEFT (COUNTERCLOCKWISE) AND MUST BE MARKED WITH AN ARROW AND WORD "OPEN" TO INDICATE THE DIRECTION TO TURN STEM TO OPEN. ALL FASTENERS USED SHALL BE STAINLESS STEEL BOOT COATINGS TO BE FUSE BONDED EPOXY OR THERMAL SET EPOXY FOR INTERIOR AND EXTERIOR-HOLIDAY FREE WITH MINIMUM THICKNESS 8 MILS MEETING OR EXCEEDING AWWA C550. EPOXY COATING MUST BE UNDAMAGED WITH NO CHIPS OR ABRASIONS. LOWER BARREL SHALL BE BITUMINOUS COATED OR EPOXY COATED. FIELD OUCH-UP OF EPOXY INTERIOR COATING IS NOT ALLOWED. FIELD TOUCH-UP OF EXTERIOR SURFACES SHALL BE IN ACCORDANCE WITH MANUFACTURES RECOATING SPECIFICATIONS ONLY. CONTRACTORS SHALL USE SPECIAL HANDLING AND INSTALLATION PRECAUTIONS WITH THE USE OF EPOXY COATED APPURTENANCES AS NECESSARY TO NSURE THAT NO COATING SYSTEM DAMAGE OCCURS. ALL EPOXY APPURTENANCES FOUND MISHANDLED AT DELIVERY OR DURING INSTALLATION SHALL BE REJECTED AND REMOVED FROM THE JOB SITE. ABOVE GRADE EXPOSED HYDRANT COMPONENTS SHALL BE COATED WITH ONE COAT ZINC RICH URETHANE PRIMER @ 2.5-3.5 MILLS DRY FILM THICKNESS. HYDRANT BARREL, BREAKAWAY FLANGE, SHALL BE COATED WITH PHEROLIC URETHANE ENAMEL GLOSS SILVER, TWO COATS @ 4.0 MILS DRY FILM THICKNESS EACH COAT. TOPCOAT SHALL PRODUCE A CONSISTENT AND HOLIDAY FREE COLOR COATING. CAPS AND BONNET SHALL RECEIVE TWO COATS OF GLOSS SAFETY RED, PHENOLIC JRETHANE ENAMEL 4.0 MILS DRY FILM THICKNESS EACH COAT. COLOR COATS SHALL PRODUCE A CONSISTENT AND HOLIDAY FREE COLOR COATING. SURFACE SHALL BE SAND BLASTED TO SSPC/SP-6 PRIOR TO COATINGS. ALL HYDRANTS SHALL BE SHIPPED WITHOUT CHAINS. MANUFACTURE SHALL PROVIDE A TEN-YEAR WARRANTY ON ALL PARTS AND WORKMANSHIP. HYDRANT REPAIR KITS SHALL BE ORIGINAL MANUFACTURE SPECIFICALLY DESIGNED FOR THE HYDRANT. ALL HYDRANTS SHALL ALSO BE MANUFACTURED TO MEET OR EXCEED ADDITIONAL DESIGN AND OPERATING CHARACTERISTICS LISTED BELOW:

5 1/4 INCH VALVE OPENING/3 PORT STYLE, DRY BARREL. **OPENING:** OPEN LEFT. DEPTH OF BURY: 5'-0" MINIMUM FROM BURY LINE TO TOP FLANGE OF HYDRANT BOOT. TWO 2 ½ INCH BRONZE HOSE PORTS 180° APART NST THREAD. ONE 4 ½ INCH BRONZE PUMPER/STEAMER 90° FROM EACH HOSE PORT, NST PORTS: ALL HYDRANTS TO HAVE TRAFFIC BREAKAWAY FLANGE. RRFAKAWAY

LOWER BARREL TO BE BITUMINOUS COATED OR EPOXY COATED.

SLIDING DRAIN SEAL TYPE. DRAIN CHANNEL SHALL BE 360 DEGREES AND CONTAIN A MINIMUM OF TWO BRONZE OR BRASS SLEEVED OUTLET DRAIN WAYS: **COATINGS:** PRIOR TO PRIMING, SAND BLAST HYDRANT TO SSPC/SP-6 PRIMED WITH ZINC RICH URETHANE COMPATIBLE COATING. TOP COAT WITH TWO COATS EACH RED AND SILVER CONFORMING TO KCWA STANDARD COLOR, SILVER BARREL AND RED CAP AND BONNET. BOOT COATINGS TO BE FUSE BONDED EPOXY OR THERMAL SET EPOXY FOR INTERIOR AND EXTERIOR - HOLIDAY FREE WITH MINIMUM THICKNESS 8 MILS MEETING OR EXCEEDING AWWA C550

STAINLESS STEEL UPPER AND LOWER STEM. ALL WETTED PARTS SUCH AS SPRINGS, PINS AND FASTENERS, SHALL BE STAINLESS STEEL OR STEM: OTHER COMPATIBLE LEAD FREE NON CORROSIVE MATERIALS. DUCTILE IRON OR CAST IRON CORE FULLY ENCAPSULATED IN RUBBER OR MULTIPLE PIECE. SEAT MAY BE EITHER BRONZE OR STAINLESS STEEL. MAIN VAI VE WEATHER SHIELD AND CAP: DUCTILE IRON.

CHAINS:

EXTERIOR

CORPORATION STOPS SHALL BE BALL TYPE WITH EITHER STAINLESS STEEL, SYNTHETIC COATED BRASS BALL OR NICKEL COATED BRASS BALL DESIGNED FOR POTABLE WATER SERVICE UP TO 300 PSI. BODY SHALL BE HEAVY CAST LEAD FREE "ENVIROBRASSII" UNS ALLOY NUMBER C89520 ASTM B584-98A AND/OR AWWA C800/ASTM B-62 MEETING OR EXCEEDING THE LEAD LEACHING PERFORMANCE SPECIFICATIONS OF ANSI/NSF 61 STANDARD. ALL CORPORATION STOPS SHALL MEET OR EXCEED DESIGN STANDARDS OF AWWA C800 ALONG WITH THE DESIGN AND OPERATING CHARACTERISTICS OF THE FOLLOWING:

FORD OR EQUAL. 34, 1 INCH, 1 ½ INCH, AND 2 INCH

NO CHAINS TO BE SUPPLIED.

OPFNING: OPFN I FFT END CONNECTIONS: COMPRESSION WITH NON-CORROSIVE GRIP RING MEETING ASTM B-159-BUNA N RUBBER AND CONDUCTIVITY RING. THREADED END SHALL BE AWWA CO TAPER THREAD FOR DIRECT TAP. HEAVY CAST LEAD FREE "ENVIROBRASSII" UNS ALLOY NUMBER C89520 ASTM B584-98A AND/OR AWWA C800/ASTM B-62 MEETING OR EXCEEDING THE LEAD LEACHING PERFORMANCES SPECIFICATIONS OF ANSI/NSF 61 STANDARD.

4.12 CURB STOPS:

CURB STOPS SHALL BE BALL TYPE WITH EITHER STAINLESS STEEL, SYNTHETIC COATED BRASS OR NICKEL COATED BRASS BALL DESIGNED FOR WATER SERVICE UP TO 300 PSI. BODY SHALL BE HEAVY CAST LEAD FREE "ENVIROBRASSII" UNS ALLOY NUMBER C89520 ASTM B584-98A AND/OR MEET OR EXCEED THE LEAD LEACHING PERFORMANCE SPECIFICATIONS OF ANSI/NSF 61 STANDARD. ALL CURB STOPS TO MEET OR EXCEED THE DESIGN STANDARDS OF AWWA C800 ALONG WITH THE DESIGN AND OPERATING CHARACTERISTICS OF THE FOLLOWING:

TYPE: SIZES: 34 INCH, 1 INCH, 1 ½ INCH, AND 2 INCH OPENING OPEN LEFT.

END CONNECTIONS: COMPRESSION WITH NON CORROSIVE GRIP RING MEETING ASTM B-159-BUNA N RUBBER AND CONDUCTIVITY RING HEAVY CAST LEAD FREE "ENVIROBRASSII" UNS ALLOY NUMBER C89520 ASTM B584-98A AND/OR AWWA C800/ASTM B-62 MEETING OR EXCEEDING THE LEAD LEACHING PERFORMANCE SPECIFICATIONS OF ANSI/NSF 61 STANDARD.

OPENING: OPEN LEFT

MATERIAL:

4.13 SERVICE & GATE BOX:
4.13.1 CURB BOXES MAY BE MANUFACTURED IN NORTH AMERICA OR SELECTED FOREIGN MADE. SELECTED FOREIGN MADE BOXES MUST RECEIVE PRIOR APPROVAL BASED ON DESIGN AND STYLE SAMPLES TO BE PROVIDED FOR REVIEW. THEY SHALL BE HEAVY PATTERN CAST IRON, BUFFALO STYLE, SLIP ADJUSTABLE TYPE WITH HEAVY CAST IRON COVER AND BRASS BOLT FASTENER TYPE LOCK. THE WORD "WATER" SHALL BE CAST UPON THE COVER IN HEAVY PATTERN RAISED LETTERS. COVERS SHALL BI DROP IN TYPE WITHOUT FINS SOLID RING. BOXES SHALL HAVE A BITUMINOUS INTERNAL AND EXTERNAL COATING IN ACCORDANCE WITH ANSI/AWWA C151/A21.5 AND ANSI/AWWA C153/A21.53 RESPECTIVELY. BOXES SHALL HAVE BARRELS OF NOT LESS THAN 2 ½ INCH IN DIAMETER. THE UPPER SECTION OF EACH BOX SHALL HAVE A BOTTOM FLANGE OF SUFFICIENT BEARING AREA TO PREVENT SETTLING. THE BASE OF THE LOWER SECTION SHALL BE A REINFORCED ARCH CONFIGURATION AND SIZED TO ENCLOSE THE CURB STOP. BOX SECTIONS SHALL BE OF SUFFICIENT LENGTH TO PROVIDE COMPLETE COVERAGE FOR THE DEPTH OF BURY. GATE VALVE BOXES MAY BE EITHER MANUFACTURED IN NORTH AMERICA OR SELECTED FOREIGN MADE. SELECTED FOREIGN MADE BOXES MUST RECEIVE PRIOR APPROVAL BASES ON DESIGN AND STYLE SAMPLES TO BE PROVIDED FOR REVIEW. THEY SHALL BE HEAVY PATTERN CAST IRON, SLIP ADJUSTABLE TYPE AND PROVIDED WITH HEAVY CAST IRON COVER. COVER SHALL HAVE THE WORD "WATER" CAST UPON IN HEAVY PATTERN RAISED LETTERS 5 ¼ INCH DIAMETER. COVER SHALL BE DROP IN TYPE WITHOUT FINS SOLID RING. BOXES SHALL HAVE A BITUMINOUS INTERNAL AND EXTERNAL COATING IN ACCORDANCE WITH ANSI/AWWA C151/A21.5 AND ANSI/AWWA C153/A21.53 RESPECTIVELY. THE UPPER SECTION OF EACH BOX SHALL HAVE A BOTTOM FLANGE OF SUFFICIENT BEARING AREA TO PREVENT SETTLING. THE BOTTOM OF THE LOWER SECTION SHALL BE BELL SHAPED AND SIZED TO ENCLOSE THE STUFFING BOX AND OPERATING NUT OF THE VALVE. BOXES HALL HAVE BARRELS OF NOT LESS THAN 5" IN DIAMETER. BOX SECTIONS SHALL BE OF SUFFICIENT LENGTH TO PROVIDE COMPLETE COVERAGE FOR THE DEPTH OF

SERVICE SADDLES AND REPAIR SADDLES SHALL BE DUCTILE IRON OR TYPE 304 STAINLESS STEEL, WITH STAINLESS STEEL BOLTS, WASHERS, NUTS AND BANDS. DUCTILE IRON COMPONENTS SHALL BE COATED WITH FUSION BONDED EPOXY MINIMUM 8 MILS THICKNESS MEETING OR EXCEEDING AWWA C550 OR NYLON COATED. SADDLES SHALL BE MANUFACTURED TO MEET OR EXCEED THE DESIGN AND OPERATING CHARACTERISTICS OF FOLLOWING:

4.14.1 SERVICE: TYPE: FORD OR EOUA DUCTILE IRON OR GRADE 18-8 TYPE 304 STAINLESS STEEL. COATING: DUCTILE IRON COMPONENTS SHALL BE EPOXY COATED AWWA C 500 OR NYLON COATED.

GRADE 18-8 TYPE 304 STAINLESS STEEL DOUBLE BAND. FASTENERS: 304 STAINLESS STEEL STUD, NUT & WASHERS.

BURY. UPPER PORTION SHALL BE 26" LONG AND THE BOTTOM SECTION 48" (MIN) IN LENGTH.

THREADED OUTLET TAPPED TO AWWA C 800 FOR THE APPROPRIATE SERVICE SIZE.

4.14.2 REPAIR:

DUCTILE IRON OR GRADE 18-8 TYPE 304 STAINLESS STEEL. COATING: DUCTILE IRON COMPONENTS SHALL BE EPOXY COATED AWWA C 500 OR NYLON COATED.

BAND: GRADE 18-8 TYPE 304 STAINLESS STEE FASTENERS: 304 STAINLESS STEEL STUD, NUT & WASHERS. GRADE 18-8 TYPE 304 STAINLESS STEEL DOUBLE BAND. VIRGIN RUBBER ASTM 2000

OUTLET: THREADED OUTLET TAPPED TO AWWA C 800 FOR THE APPROPRIATE SERVICE SIZE.

ALL COMPONENTS AND FASTENERS SHALL BE TYPE 304 STAINLESS STEEL. GASKET SHALL BE VIRGIN RUBBER FOR WATER SERVICE. ALL REPAIR CLAMPS SHALL BE MANUFACTURED TO BE EQUAL TO THE MATERIAL AND DESIGN REQUIREMENTS THE FOLLOWING:

TYPF: FORD OR FOLIAL GRADE 18-8 TYPE 304 STAINLESS STEEL

FASTENERS: 304 STAINLESS STEEL STUD, NUT & WASHERS. GRID PATTERN VIRGIN RUBBER ASTM 2000, FULL 360 DEGREE COVERAGE.

4.16 DUCTILE IRON COUPLINGS:

STRAIGHT AND TRANSITION COUPLINGS SHALL BE DUCTILE IRON MANUFACTURED TO MEET AWWA C 219 AND FITTED WITH STAINLESS STEEL BOLTS WASHERS AND NUTS.

TO STAIGHT AND TRANSITION COUPLINGS SHALL BE DUCTILE IRON MANUFACTURED TO MEET AWWA C 219 AND FITTED WITH STAINLESS STEEL BOLTS WASHERS AND NUTS.

AND THE COUPLINGS SHALL BE DUCTILE IRON MANUFACTURED TO MEET AWWA C 219 AND FITTED WITH STAINLESS STEEL BOLTS WASHERS AND NUTS. DUCTILE IRON COMPONENTS SHALL BE COATED WITH FUSION BONDED EPOXY MINIMUM 8 MILS THICKNESS MEETING OR EXCEEDING AWWA C550. COUPLINGS SHALL BE MANUFACTURED TO MEET OR EXCEED THE DESIGN AND OPERATING CHARACTERISTICS OF THE FOLLOWING:

4.16.1 STRAIGHT: FORD OR FOLIAL TYPF:

DUCTILE IRON. COATING: DUCTILE IRON COMPONENTS SHALL BE EPOXY COATED AWWA C 500.

FASTENERS: 304 STAINLESS STEEL STUD, NUT & WASHERS. RUBBER ASTM 2000.

4.16.2 TRANSITIONAL:

DUCTILE IRON.

COATING: DUCTILE IRON COMPONENTS SHALL BE EPOXY COATED AWWA C 500. FASTENERS: 304 STAINLESS STEEL STUD, NUT & WASHERS. RUBBER ASTM 2000.

ALL DEVICES MUST HAVE BEEN APPROVED BY THE UNIVERSITY OF SOUTHERN CALIFORNIA (FCCCHR, USC), AMERICAN WATER WORKS ASSOCIATION AND AMERICAN SOCIETY OF SANITARY ENGINEERS. BACKFLOW DEVICE ASSEMBLIES TESTED WITH MANUFACTURES ISOLATION VALVES TO MEET FCCCHR, USC STANDARDS SHALL BE INSTALLED WITH THE MANUFACTURER VALVES AS AN ASSEMBLY. BRONZE OR BRASS COMPONENTS SHALL MEET OR EXCEED THE LEAD LEACHING PERFORMANCE SPECIFICATIONS OF ANSI/NSF 61 STANDARD OR BE MANUFACTURED WITH LEAD FREE "ENVIRO BRASS II" USN ALLOY NUMBER C89520, ASTM B584-98A

4.18.2 SELECTED BACKFILL MAY BE FROM EXCAVATED MATERIALS THAT SHALL BE FREE DRAINING, CLEAN, GRANULAR SOIL SUITABLE FOR BACKFILL. IT SHALL BE FREE FROM

PEAT, VEGETABLE OR ORGANIC MATTER OR ANY OTHER DEBRIS AND SHALL BE READILY COMPACTABLE TO THE REQUIREMENTS OF KENT COUNTY WATER AUTHORITY,

TYPE 5 TRENCH. RECYCLED ROAD SWEEPINGS AND CONTAMINATED MATERIAL ARE FORBIDDEN. UP TO 20 PERCENT MAY BE ROCK LIKE MATERIAL, NOT TO EXCEED 3

4.17.1 TESTABLE DOUBLE CHECK: TYPE: WATTS OR FOUAL

> CAST IRON, BRONZE OR STAINLESS STEEL DEPENDING ON SIZE. COATING: IRON COMPONENTS SHALL BE EPOXY COATED AWWA C-500.

SPRINGS: STAINLESS STEEL PRESSURE: MAXIMUM 150 PSI MINIMUM 10 PSI.

4.17.2 TESTABLE REDUCED PRESSURE:

WATTS OR EQUAL. CAST IRON, BRONZE OR STAINLESS STEEL DEPENDING ON SIZE. COATING: IRON COMPONENTS SHALL BE EPOXY COATED AWWA C-500.

SPRINGS: STAINLESS STEE PRESSURE: MAXIMUM 175 PSI - MINIMUM 10 PSI.

4.17.3 HOUSEHOLD DUAL CHECK: WATTS OR EQUAL.

BODY: CAST BRONZE. SPRINGS: STAINLESS STEEL PRESSURE: MAXIMUM 150 PSI - MINIMUM 10 PSI.

4.18.1 PIPE BEDDING SHALL BE PROCESSED BORROW GRAVEL. GRANULAR IN NATURE, THE MAJOR PORTION OF WHICH MAY BE SAND OR GRAVEL. IT SHALL BE FREE FROM PEAT, VEGETABLE OR ORGANIC MATTER OR ANY OTHER DEBRIS AND READILY COMPACTABLE. RECYCLED ROAD SWEEPINGS AND CONTAMINATED MATERIAL ARE

INCH IN LENGTH OR DIAMETER AND MUST BE EVENLY DISTRIBUTED WITHIN THE TOTAL VOLUME OF THE FILL.

REVISIONS:

NO. DATE. DESCRIPTION

R2 7/2023 PERMIT SET

ESIGNED BY: WMLJR

PROJECT NO: NOV. 2022

PRELIMINARY, NOT FOR

CONSTRUCTION

KCWA

NOTES

SHEET

9 OF 9

DRAWN BY: SEP

CHECKED BY: JAC

R1 1/9/22 REV. SETBACKS

R3 12/2023 CITY COMMENTS

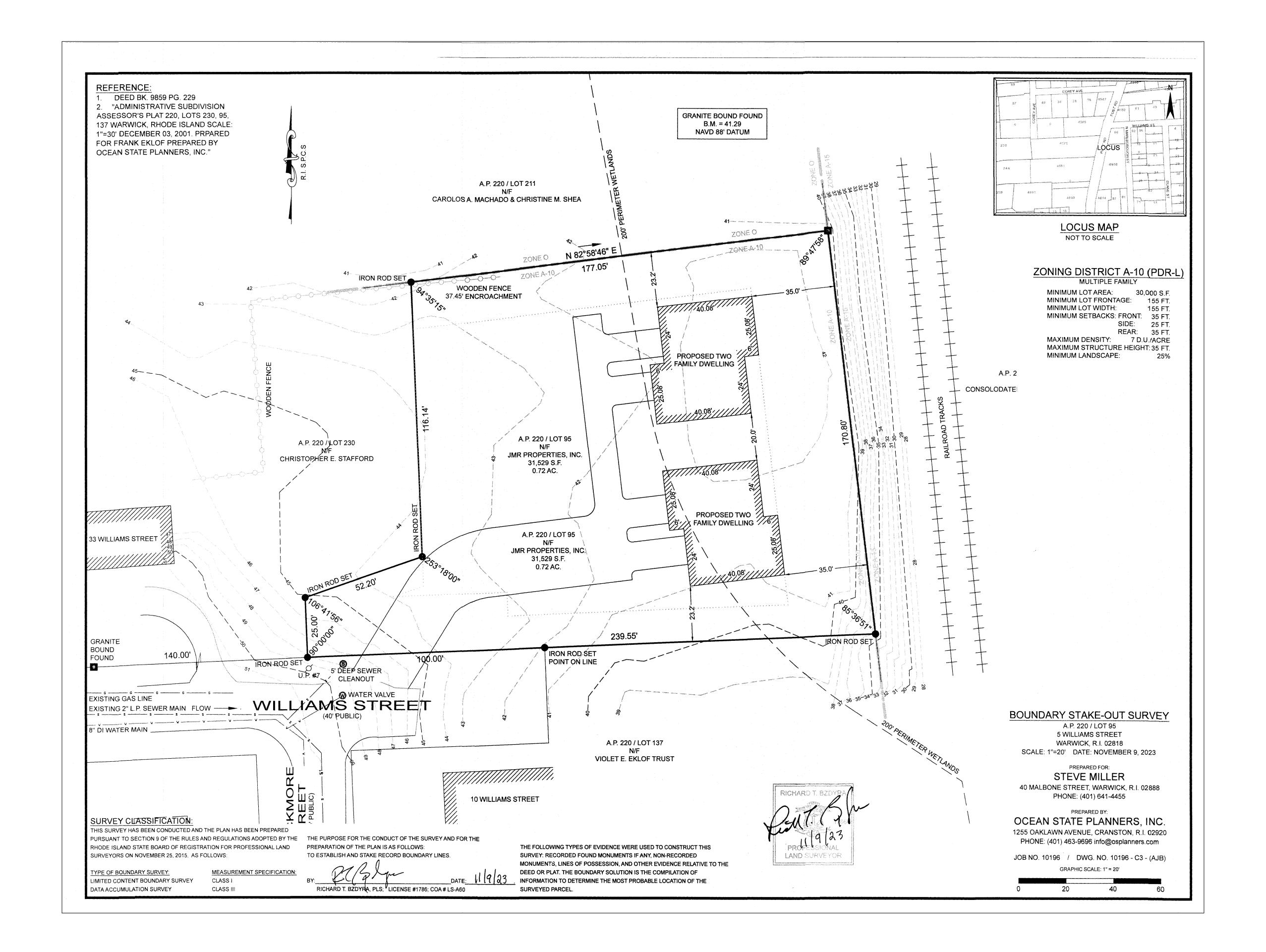
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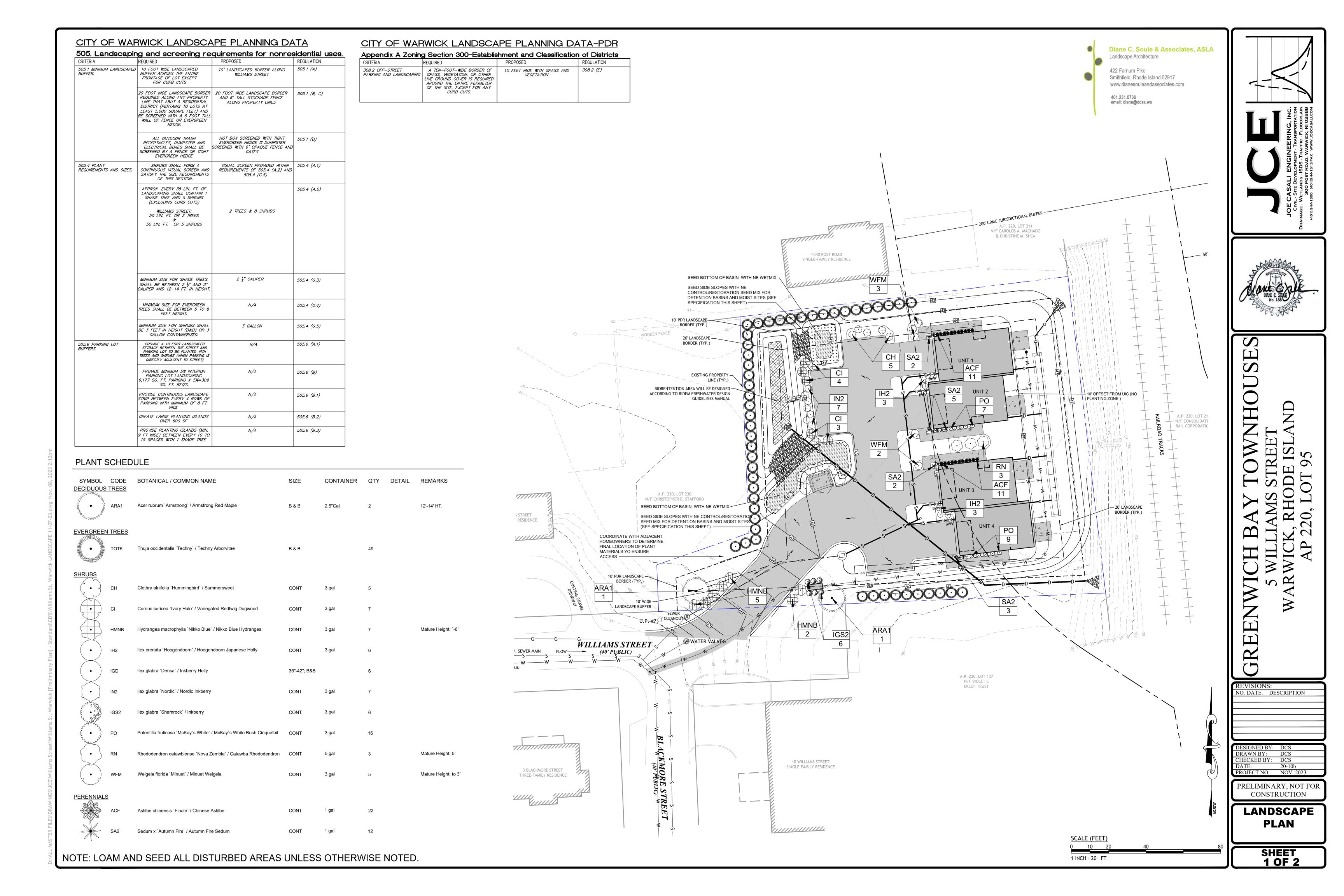
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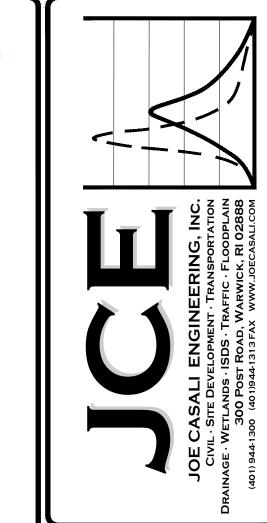
REGISTERED

12/5/2023

PROFESSIONAL









MIXTURES ARE USED.

6. UNLESS OTHERWISE APPROVED BY THE A/E, ALL PLANTS SHALL BE NURSERY GROWN IN ACCORDANCE WITH GOOD HORTICULTURAL PRACTICES AND SHALL HAVE BEEN GROWN UNDER CLIMATIC CONDITIONS SIMILAR TO THOSE IN THE LOCALITY OF THE PROJECT FOR AT LEAST

7. SET PLANTS PLUMB AND AT SUCH A LEVEL THAT AFTER SETTLEMENT THEY BEAR THE SAME RELATION TO THE SURROUNDING GROUND AS THEY BORE TO THE GROUND FROM WHICH THEY WERE DUG. SETTLE BACKFILL MATERIAL FOR PLANTS, THOROUGHLY & PROPERLY, BY FIRMING OR TAMPING. ACCOMPANY BACKFILLING WITH THOROUGH WATERING UNLESS OTHERWISE

8. FERTILIZE SHRUB BEDS WITH 10-6-4 FERTILIZER AT THE RATE OF 3 POUNDS PER 100 SQUARE FEET OF SURFACE AREA, BROAD CAST. APPLY THE FERTILIZER UNIFORMLY TO THE SURFACE BEDS AND WORK INTO THE UPPER TWO (2) INCHES OF SOIL. FERTILIZE INDIVIDUAL TREES AT THE RATE OF ONE (1) AGRIFORM PELLET PER INCH OF TREE DIAMETER (FOLLOW MANUFACTURER'S WRITTEN INSTRUCTIONS). APPLY A SECOND APPLICATION OF FERTILIZER TO ALL PLANT ITEMS AT THE SAME SPECIFIED RATES OVER THE MULCH AT THE END OF AN

9. CONTAINER GROWN MATERIALS: REMOVE PLANT FROM CONTAINER AND "BUTTERFLY" ROOT

10. AFTER PLANTING PRUNE ONLY BROKEN OR DEFORMED BRANCHES AND IN SUCH MANNER

11. IMMEDIATELY AFTER PLANTING, STAKE TREES OVER FIVE (5) FEET AS INDICATED ON DETAIL DRAWING INDICATED OR APPROVED BY THE OWNERS REPRESENTATIVE.

MULCH SHALL BE APPLIED A MINIMUM OF THREE (3) INCHES IN DEPTH IN ALL PLANTING BEDS,

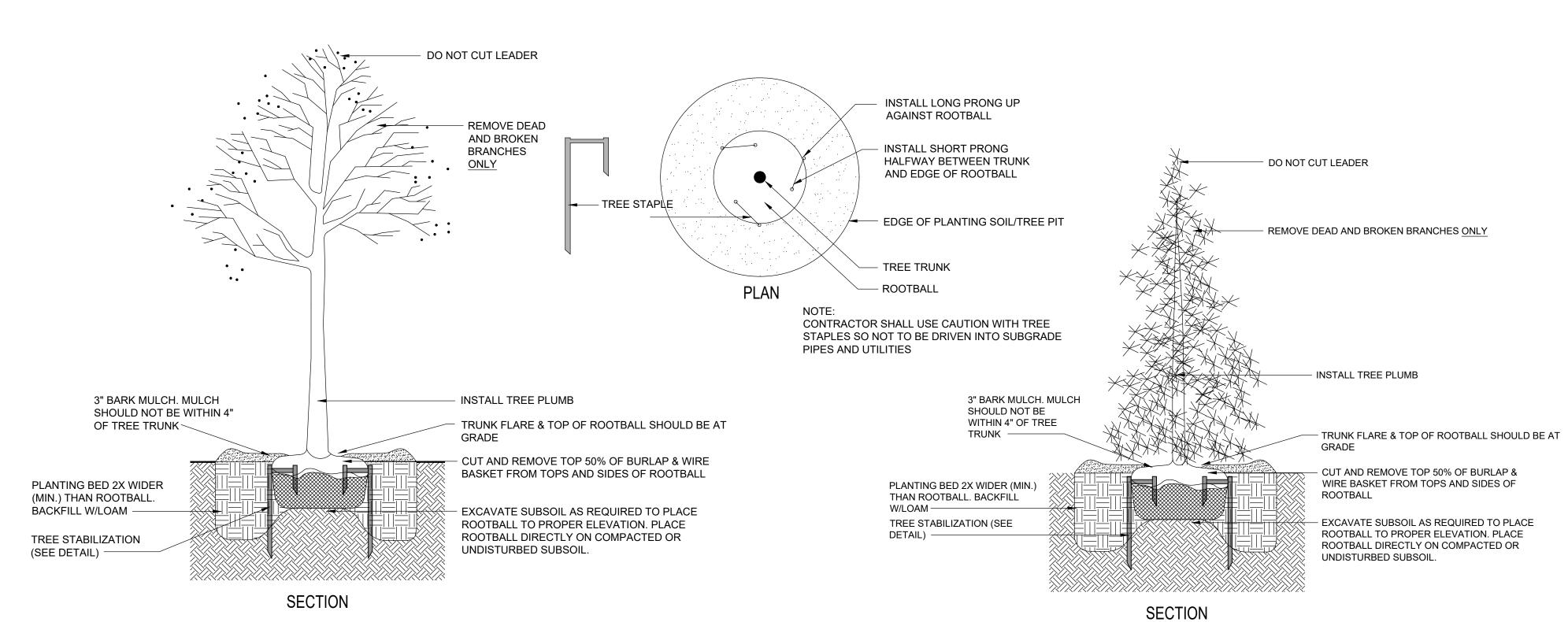
12. THE PLANTS SHALL BE WATERED IMMEDIATELY FOLLOWING PLANTING, PREFERABLY WHEN TWO THIRDS OF THE BACKFILL HAS BEEN PLACED SO ALL AIR POCKETS ARE REMOVED AND THE PLANT PROPERLY SET. ADDITIONAL WATERING SHALL BE MADE AT LEAST ONCE EVERY

13. INSTALL 'JUTE MESH' EROSION CONTROL FABRIC WHERE FINAL GRADES ARE 3:1 (33%) OR

14. UNLESS OTHERWISE SPECIFIED, CONTRACTOR TO LOAM AND SEED ALL DISTURBED AREAS. SEEDING NOTE: USE UNIVERSITY OF RHODE ISLAND NO. 2 IMPROVED SEED MIX OR EQUAL.

15. LANDSCAPE ESTABLISHMENT AND MAINTENANCE NOTE: CONTRACTOR SHALL ENSURE THAT ALL LAWN AREAS AND PLANTINGS ARE FULLY ESTABLISHED AND ACCEPTABLE TO THE OWNER'S REPRESENTATIVE PRIOR TO RELINQUISHING THEIR RESPONSIBILITIES FOR MAINTENANCE OF THESE AREAS.

16. TREE PROTECTION NOTE: NO MATERIAL, TEMPORARY SOIL DEPOSIT OR EXCAVATION SHRUBS OR TREES TO REMAIN. ANY RETAINED EXISTING VEGETATION SHALL BE PROTECTED AS PER DETAIL ON PLAN.

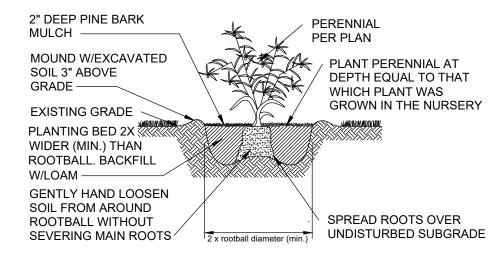


EVERGREEN TREE PLANTING DETAIL

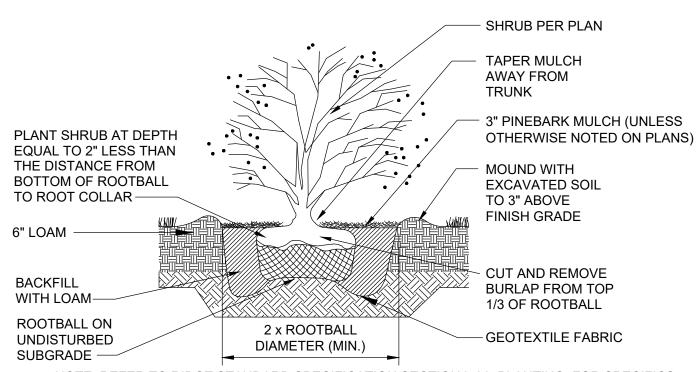
TREE PLANTING DETAIL

- CLEAN CUT VERTICAL EDGE AT PLANTING BED AND LAWN WHERE SHRUBS ARE PLANTED IN MASS. TAPER PLANT MIX. BACKFILL AND MULCH TO 2" BELOW VERTICAL EDGE OF LAWN CUT TO ASSURE THAT MULCH STAYS IN SHRUB

SHRUB PLANTING AT LAWN EDGE not to scale



PERENNIAL PLANTING DETAIL



NOTE: REFER TO RIDOT STANDARD SPECIFICATION SECTION L.06, PLANTING, FOR SPECIFICS

SHRUB PLANTING DETAIL

2. REPLACEMENTS: PLANTS OF SAME SIZE AND SPECIES AS SPECIFIED, PLANTED IN THE NEXT

LANDSCAPE NOTES:

COMPLETION'.

GROWING SEASON, WITH NEW WARRANTY AND EXTENDED MAINTENANCE SERVICE COMMENCING ON THE DATE OF REPLACEMENT.

1. GUARANTEE THAT, UPON COMPLETION AND FINAL ACCEPTANCE, LANDSCAPE PLANTINGS

PLANTINGS FOR A MINIMUM OF TWO (2) YEARS, INCLUDING TWO (2) CONTINUOUS GROWING SEASONS. COMMENCE WARRANTY ON DATE IDENTIFIED IN THE 'CERTIFICATE OF FINAL

CONFORM TO REQUIREMENTS OF CONTRACT DOCUMENTS. PROVIDE A WARRANTY FOR TREE

3. PLANT MATERIALS SHALL BE OF SIZE AND CALIPER REQUIRED AND CONFORM TO THE REQUIREMENTS DESCRIBED IN THE LATEST EDITION OF AMERICAN STANDARD FOR NURSERY STOCK, PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN.

4. PLANTS OF OTHER KINDS THAN THOSE NAMED IN THE PLANT SCHEDULE SHALL NOT BE ACCEPTED WITHOUT APPROVAL. REPLACEMENT PLANTS LARGER IN SIZE THAN EXISTING MAY BE USED IF APPROVED BY THE A/E, PROVIDED USE OF LARGER PLANTS DOES NOT INCREASE CONTRACT PRICE.

5. A PROFESSIONAL HORTICULTURIST/NURSERYMAN SHALL BE CONSULTED TO DETERMINE THE PROPER TIME TO MOVE AND INSTALL PLANT MATERIAL SO THAT STRESS TO THE PLANT IS MINIMIZED. PLANTING OF DECIDUOUS MATERIAL MAY BE CONTINUED DURING WINTER MONTHS PROVIDED THERE IS NO FROST IN THE GROUND AND FROST-FREE TOPSOIL PLANTING

TWO (2) YEARS.

APPROVED. FORM SAUCER CAPABLE OF HOLDING WATER AROUND INDIVIDUAL PLANTS.

EIGHT WEEK PERIOD.

BALL OR OTHERWISE SPREAD OUT ROOTS ON SETTING MOUND. BACKFILL SHALL BE SIFTED THROUGH THEM AND SOLIDLY FIRMED.

AS TO PRESERVE NATURAL CHARACTER OF PLANT.

AS INDICATED ON THE DRAWINGS.

THREE (3) WEEKS UNLESS OTHERWISE DIRECTED UNTIL FINAL ACCEPTANCE OF THE PLANT MATERIAL.

GREATER PER MANUFACTURER'S INSTRUCTIONS.

TREE PRUNING NOTE: STREET TREES SHOULD BE PRUNED TO MAINTAIN A MINIMAL BRANCH HEIGHT OF 8' WITHIN TWO (2) YEARS OF INSTALLATION OF THE TREE.

SHALL OCCUR WITHIN FOUR FEET OF SHRUBS OR WITHIN TWO FEET OF THE DRIP LINE OF ANY

DRAWN BY: DCS CHECKED BY: DCS PROJECT NO: NOV. 2023 PRELIMINARY, NOT FOR

NO. DATE. DESCRIPTION

DESIGNED BY: DCS

LANDSCAPE **DETAILS**

CONSTRUCTION

SHEET 2 OF 2